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STEAM CULTIVATION.

BY COL. C. W. SALADEE, OF PADUCAH, KY.

NO. I.

"I know of no pursuit, in which more real and important service can be rendered in any country, than by improving its agriculture."—[GEORGE WASHINGTON.

ED. VALLEY FARMER: With your kind permission, I propose to write a series of articles for publication in your excellent journal, upon the important subject of *Steam Cultivation.*

Having myself had considerable experience in the field of invention, particularly in the application of steam to agriculture, I feel warranted in presuming to possess some degree of knowledge upon the problem of steam cultivation, that may not be altogether uninteresting to your numerous readers. The object of these articles will be to point out the manifest defects of, and the mechanical impossibilities attending, all past experiments in this particular department of inventive science. And, at the same time, to describe, as I believe, a practical system, through which the extensively applicable power of steam can be made to tear up the unyielding soil of the wide-spread prairies of the great West and South, and to do all the common drudgery of the farm and plantation to which steam can be applied.

It is a fact worthy of note, that in nearly all past experiments to "plow by steam," the idea of accomplishing the feat by the use of the *old plow* has been almost universal. No idea has been so prevalently entertained, as that of a *traction* engine, which shall be so constructed as to propel its own ponderous weight and drag a certain number of plows after it. It is a fact equally worthy of reflection, that no idea can be more erroneous in its results, or more directly antagonistic to the well defined laws of mechanics.

The *traction* engine, when used for the purpose of dragging plows after it in the usual old way, has this insurmountable difficulty confronting it:—To settle the question of economy in the use of the traction engine for steam plowing, a certain amount of work must be performed in a given time. For the purpose, therefore, of doing that quantity of work which will settle the question of economy, from eight to ten plows must be dragged by the engine. We now have to consider the amount of resistance we have to overcome when dragging a gang of say eight plows at eight inches deep. When we have made our experiments to ascertain this point, we will have made the discovery that the engine we design to draw those plows will have a heavier burden to drag than is seldom, if ever, imposed upon the massive locomotive engine upon the unyielding surface of the iron rail. Almost any school-boy understands the principle which imparts to the traction engine its power to draw—viz., *Its own*

weight. Now that the resistance which the soil will offer a gang of eight plows is very great, a corresponding weight must be imposed upon the engine which is intended to draw them. And right here is where we meet with the mechanical impossibility of plowing by steam successfully upon the traction principle—for the obvious reason that the immense weight, by which only the required degree of traction power is attained, renders the engine a worthless, helpless machine when placed upon a soft or yielding surface like that over which the steam plow must travel.—For just in proportion as the weight of the engine is increased to create the necessary degree of traction power, in a like proportion do we magnify the difficulty of propelling it over that character of surface the prairie farm or plantation presents. Take your ten or twenty ton engine and place it upon an unyielding surface, like that of the iron rail, and every pound weight you impose upon it will impart a corresponding degree of traction power. But the "weight of engine" which in this case imparts the power to draw, is the very principle which destroys that power when you take from under the engine the hard and unyielding surface and substitute one of an opposite character.

Messrs. J. & F. Howard of Bedford, and Mr. Fowler of Cornhill, Eng., seem to have been among the first of our European brother inventors to comprehend the difficulties attending the use of the traction engine above presented. They seem to have made the discovery—naturally enough—that the mechanical results of the anchor and that of the locomotive engine are directly opposite to each other, and that to connect one with the other is simply a gross mechanical absurdity. This absurdity is embodied in all attempts at steam cultivation, where a traction engine is used to drag the plows. For a more effectual anchor than a plow set in the ground at eight or ten inches, cannot well be imagined. The result of an ancher is to hold at rest whatever may be attached to it, while that of the engine in question is locomotion. Hence, we have two principles embodied in the traction system of steam plowing, which are as directly antagonistic one to the other as any two opposite principles can be. Therefore, the idea of combining the locomotive or traction engine with the common plow, or anchor, is fundamentally erroneous.

The Messrs. Howards and Fowler of England have attempted in a very creditable manner to overcome the manifest difficulties in the traction system of plowing, by dispensing with the traction engine altogether, and resort to dragging the plows across the field by means of wire ropes connected to a portable steam engine. By this system of plowing, one important point is attained, viz: that of applying the primary power of the steam to the work to be done. On the traction principle, the primary force of the engine is directed to the propelling of its own ponderous weight, and through which it is secondarily transmitted to the plows.

But while this advantage is attained by the "wire-rope system," its projectors fall into the same old error of holding on to the old plow.—While, therefore, the traction system fails of success, because of its being a mechanical impossibility to attain the object sought after in that way, the wire rope system must likewise fail in a practical sense: 1st. Because of its inability to perform its work in any better, or more effectual manner than the same can be done in the old way; and, 2d. Because it never can compete with the old system of plowing in point of economy.

The most favorable performances accredited to the wire rope system is, that by it from six to ten acres can be plowed in one day—usually requiring eight men to manage it. Now, when we consider the cost of the number of hands required, cost of machinery and ropes, wear and tear of same, consumption of fuel, liabilities to delay from breakage, interest and tax on the whole investment, to which add the fact that when done, the work is of no better quality, the soil disturbed no deeper, or any more thoroughly pulverized than that done by the old system of plowing—we are driven to the unavoidable conclusion that such a system of steam cultivation can never be made a positive success.

In looking over the past history of inventions and experiments in this direction, we are struck with the apparent impossibility of the inventive mind to divest itself of the idea that steam cultivation cannot be accomplished in any other way than by the use of the old drag plow. Until this idea of draft cultivation is entirely abandoned we may never expect to see steam cultivation a practical success.

What man of the present day and generation, would think of retaining the old hand plane in the planing machine, the scythe in the mowing machine, the common oar in the steam-ship, or the hand flail in the threshing machine? Though perhaps nearly all of those rude attempts were made before it was discovered that

"Tis good to be off with the old love
Before ye be on wi' the new."

Ordinary draft plowing is one thing, and plowing

by steam is another. Get rid of the one and take up with the other, and you have no more to do with the old plow than a horse has to do with a hoe. In the one case it is done by straight draft, while in the other it will have to be done by a circular motion.

I repeat, that before we may hope for success in steam cultivation we must leave behind us, and entirely out of the question, the old straight-furrow plow, and take up with the higher laws and principles of "circular action" in steam machinery.

And, we must not only expect to see a complete revolution in the manner of breaking or pulverizing the soil, but we must also prepare ourselves to see a like revolution in the arrangement and management of the farm or plantation upon which steam cultivation is to be introduced.

In my next paper I shall proceed to describe in detail, the machinery pertaining to the rotary steam plow, of my own invention, Patented June, 1861, and which was, in part, illustrated by a beautifully executed engraving of the same in No. 10, Vol. 4, new series, *Scientific American*, New York.

I also propose giving in future papers, my plans for the arrangement and management of the farm or plantation upon which steam cultivation is to be introduced, and in due time to consider the subject in a pecuniary point of view.

Ashland Farm, Ky.

SORGHUM AND IMPHEE.

Ed. Valley Farmer: The time for planting will soon be here, and I wish to add my experience for the benefit of others, as my trouble till last year was in getting a good stand. I planted by hand, and covered with hoe. I drilled with the Cherokee Corn Planter, but had only a very poor stand. I have no faith in soaking seed; I have tried it with maize (Ind. corn). Last spring I considered that putting the Sorghum or Imphee seed too deep in the ground was the fault; I therefore resolved to lay off my ground with a common one-horse shovel-plow, in rows about three feet six inches apart. I then dropped the seed about one foot six inches in the row, stepping on the seed as I advanced, this put it in sufficiently deep; and last spring being very dry it was an advantage to plant it in the trench made by the shovel plow. It had also another advantage planted so shallow, it took less or rather no hoeing, it came up before the weeds; and the earth thrown towards it with a double shovel-plow kept down the weeds without burying the stalks too deep, and it only needed thinning where the stalks were too thick. It was a perfect success; there was no vacancies in the rows, the seed came up in about a week in the dryest kind of weather, and I planted five different kinds.

The best was some I obtained from P. W. Gates & Co, Chicago—Imphee black seed. I was disappointed in its growth, I was disappointed when it headed out, it seemed an inferior kind of Sorghum; but when we cut it up it was very sweet and of pure flavor, and when manufactured was the sweetest and most like honey of any that I have seen, and it was boiled in much less time than any other; and I made up some ten different crops. Crops raised on the Mississippi bottom or alluvial prairie land are not worth working up, as the flavor is so inferior, and with one crop it seemed as if the longer you boiled it did not get thinner—yet thicker it did not grow, and I did not wish to boil it till it all disappeared.

J. M. Dixon.

Manuring Corn in the Hill.

Years ago, when we commenced farming, we prepared a piece of ground for corn. The soil was moderately fertile. We plowed (stubble) in the fall. The ground was in tolerable order. There were perhaps three acres, about half an acre of which we manured in the hill, taking the manure from the hog-pen which had accumulated during the previous summer. It was quite moist, and in that condition we applied it. We gave each hill a pound or two; some rows more, some less; scattered a little ground over it, and planted.

The corn came up readily, with good color, darker than the unmanured, and broader bladed. It pushed forth at once, out-stripping and leaving behind the pale, sickly-hued corn at its side, growing darker and coarser, and broader-leaved, till it stood out almost a miracle.

At hilling time (corn was hoed and hilled those days) it was so large that it was with the greatest difficulty the horse and plow passed through without snapping off the large, fine stems.

The other corn was very backward, not fit for the hoe yet, but even, increasing in color and advancing in growth. The manured corn was somewhat uneven, though the smallest hills were larger than the best of the unmanured. The contrast was all contrast. But here it began to stop. The growth of the rapid corn became checked; it seemed almost suspended after awhile. And when the sun began to draw in July, the unmanured corn began to thrive and advance rapidly upon the precarious corn by its side, and in the fall was nearly up with it, and turned out almost as well.

The next year the corn-ground was put to grain. The effect of the manure was visible during the summer, and in the fall turned out more proportionally than the unmanured part.

We account for the partial failure in the case

of the corn in this way. The roots soon penetrated the manure and the enriched ground beneath, and after that received less nourishment from the manure, and finally sought it in the farther depths out of the reach of the manure. The roots of the grain (oats) were less penetrating, and the strength of what manure remained were mixed with the soil throughout. It will be seen therefore that corn requires a rich subsoil. It was the last attempt at manuring corn in the hill, though we had seen better success before. On the whole, however, we think, and decidedly, that manure is better turned under for corn. That is our experience. We have seen excellent success with barn-yard manure on green-sward turned under in the spring, manure made in the winter. At first the corn would not do so well; but the heats of July and August set the manure in motion, and there was an almost unexampled growth. The result was good corn, and ripe in due season. Still we prefer a good start in the spring. Then, with a rich undersoil, there is no difficulty.

All this happened in the State of New York, where the condition for corn is different from what it is in the West. All seems to depend upon the heats of mid-summer. Corn, the past year, was considered a failure till August began to stretch it out. The growth, then, was perfectly unprecedented. The result was, to the astonishment of every one, an excellent crop of corn. Not only that, though planted late and very backward, it all got ripe, and in due season. It was growth, day and night, uninterrupted.

This, however, is no argument in favor of late planting, or against manuring in the hill, or anything that will give an early start—for the few pieces of corn that had these advantages, were not any the worse for it. There was not any more straw, but there were more ears and larger, and the corn was ripe from one to two weeks sooner. This is sufficient to encourage early attention. Besides, had the season failed throughout as at first, the corn, early attended to, would still have reached the ripening point, and been a fair crop. These little attentions are not to be despised. F.G.

Depth of Covering Wheat.—The redoubtable John Johnston of "Near Geneva," N.Y., has this upon the subject: "If Mr. Hillman, or any other man, plows in wheat more than three inches deep, it will always come up spindling and poor. Two inches is deep enough to cover wheat, unless the autumn should prove very dry."

In the above extract is a point that we think settles the question. It is, "unless the autumn should prove very dry." Experience has proved it the world over that there is no difficulty in wheat coming up, unless insects or some accidental cause prevents. Grain covered too deep will not vegetate; left near the surface in a drouth it will be the same. But wheat sown too deep for wet weather will come up in a dry time; and when covered scantily, will vegetate in moist weather. When covered part deep, part thin, as is the case, it may defy all weathers if sown plentifully; for there will be enough to meet any condition; a good share can afford to be too deep or too shallow, and be lost, and yet enough left for a crop. Sow plenty of seed then.

CULTURE OF TOBACCO.

[Continued from March No.]

Priming and Topping.—When the plant has grown to the height of two or three feet, a round bud will make its appearance in the centre of the plant. This is the *flower-bud*, and is called the "button" in some parts of Virginia. At this period of growth, some of the lower leaves should be pulled off, so as to leave the stalk naked for five or six inches above the ground. The stripping of these lower leaves is called "priming." At the same time that the priming is done, the flower-bud is broken or nipped off with the thumb and finger. If the plant is sufficiently large, it may be topped before the flower-bud appears, by nipping out the central leaf-bud. "There is great difference of opinion as to the proper height of topping. From 8 to 20 leaves are recommended—the latter for manufacturing. If the tobacco is pretty forward and the land rich, at first, prime off just enough of leaves to hill up the tobacco well, and top to 12 or 14 leaves. Continue to top to 12 leaves until the first of August, then top to 10 until middle of August, and from that time until first of September top to 8, afterwards to 6." If the topping were omitted, the flower-bud would soon be developed into a branching top, full of clusters of flowers, from which the seeds are afterwards produced.

Suckering.—Soon after the topping is done, the axillary buds at the bases of the leaves begin to grow rapidly, and, if let alone, form branches of the main stalk. They are called "suckers," and must be broken out as soon as they are large enough to be caught with the thumb and finger. This process has to be repeated from time to time, as new suckers make their appearance. Meantime the green worm will have commenced its ravages, and must be carefully picked off and destroyed; otherwise,

it will soon disfigure and greatly injure the crop.

The *philosophy* of priming, topping, and suckering is easily understood when we refer back to what has already been said (Chap. XI) on the physiology of plants. All parts of the plant are designed to aid in its mature growth, and ultimate production of seeds. As the period approaches for maturing the seeds, nearly all the vital energy of the various organs seems to be directed towards, and expended upon them. If the first flower-bud is removed, the natural vigor of the plant is not destroyed, but only diverted towards the leaves and axillary buds, strengthening the former, and causing the latter to spring up as suckers. But when the suckers are removed, the whole vigor of the plant is concentrated in the remaining leaves. A choice of the most perfect leaves is made by "priming off" those nearest the earth, and which not only would not themselves attain a vigorous growth, but would exclude the air and light too much from the middle leaves of the plants, which are always the most vigorous. The number of leaves left in topping is determined in part by the apparent strength of the plant, and in part by the length of time it has for maturing its leaves.—The more forward plants have a longer season of growth after topping, and can hence bear a greater number of leaves; while the latter ones must be topped lower.

Cutting.—The maturity of the plant, and consequent fitness for cutting, is indicated by the points and edges of the leaves curling downward, the leaf becoming thick and brittle, and its surface assuming a yellowish spotted (piebald) appearance in some varieties, and on some soils, especially new land; and a fine glossy appearance in others. At this stage, the plant contains more of those ingredients which subsequently give value to it, than at any period either earlier or later. It should then be cut, and not till then, unless it is becoming fired,* or is in immediate danger from frost. The cutting consists in splitting the stalk with a sharp, thin-bladed knife, down nearly to the lowest leaf, and then cutting it off just below this leaf. As the plants are cut, they are inverted between the hills, and allowed to remain in that position a few hours, until they are sufficiently wilted to be handled without being broken. They are then collected and placed (8 or 10 together) upon sticks, and hung upon scaffolds in the open air, or in the tobacco barn.

*The "Black Fire" is a disease which is often very destructive to the tobacco crop. It produces decayed spots over the leaves. A mixture of common salt with guano is recommended as a preventive.—[Southern Planter, May, 1858.

HARROWING WINTER GRAIN.

Some years ago, in the State of New York, a farmer, who had read an agricultural paper, was found one spring day in his wheat field with his harrow, harrowing away in good earnest, to the no small astonishment of his neighbors, who were certain the man had gone clean daft.

But he kept on harrowing, till his lot was harrowed over. Then he followed with the roller. It was the topic for a week—the lunacy of Mr. Wright. Why he did so, was asked. "I wanted to make my seed take"—he had been sowing clover seed.

"Indeed!" and wise looks were exchanged by the neighbors.

But the bare field began to green up under the influence of the May showers; and the finest tufts of wheat were growing there, in the world. These continued to spread.

"You will have some wheat; but never what you harrowed out," said the neighbors. The man said nothing. He was determined to see what virtue there was in agricultural papers; so he kept his own counsel, believing in the integrity of intelligent men.

There were cold rains, and many of them. But the wheat darkened and grew like a cloud. The neighbors passed, but it was their turn now to say nothing. By-and-by the ground was occupied. The wheat rose; and such a field was no where to be seen, holding in shade the young clover that covered the black soil.

When this great crop of wheat was harvested, the farmer pointed his neighbors to the thick seeding that covered the ground: "There is the effect of my harrowing." They were hearing a plea, and it was not a very disagreeable one.

The science of farming is pretty well established in that neighborhood, now.

Fence Posts.—Taking the vast extent of our country into consideration, an incalculable expense is incurred every spring in the putting up of new fences and the repairing of old ones. It has been found that one great cause of this trouble and expense is the rapid decay of those parts of timber fence posts that are inserted in the ground. Fences would last three times longer than they usually do, could those parts that are covered in the earth be so treated as to render them as durable as those parts that are exposed above ground. A great saving would therefore be effected by any simple method of treatment to prevent rot in fence posts. This may be effected in two ways. One, by boiling the feet of fence posts in coal tar; the other, by charring them. As few farmers can obtain coal tar, the latter mode is the most convenient for them to practice. About eighteen inches in length of the foot of each post should be charred to the depth of one-third of an inch. It is well known that charcoal is a very fixed substance. It will scarcely change its condition by exposure to the natural elements, and it therefore forms an almost indestructible coating to the interior timber of posts.

COTTON CULTURE.

(Continued from March No.)

CULTURE.—"As soon as the young cotton is up to a good stand, and the third and fourth leaves begin to appear, the operation may commence. In lands which are smooth and soft, I incline to the opinion, that the hoes should precede the plows, chopping into bunches, passing very rapidly on, and let a careful plow-man follow on each side of the drill, throwing a little light dirt into the spaces made by the hoe, and a little also about the roots of the cotton, *covering, and leaving covered*, all small grass which may have sprung up. This is, indeed, the merit claimed for the operation, that, after the hoes have passed, the plows come on and effectually cover and destroy the coat of young grass then up. This is known to practical planters to be the crop of grass which escapes the hoe, and does mischief to the cotton. But when the land is so rough as to endanger the covering of the cotton with the plow, the operation must be reversed, and the hoes follow the plows. All that is now proposed to be done is a very rapid superficial working, reducing the crop to bunches, soon to pass over and return again, for a more careful operation. This should be done as soon as possible, as will be indicated by the necessities of the case. The grass and the weeds must be kept down, and the stand of cotton reduced. At this first working, unless in lands already very soft, I should advise the siding to be close, and to be done with some plow which would break and loosen the earth deep about the roots of the young plant. Others may theorize as they choose, but with a plant sending out a tap-root, upon which it so much relies, and striking so deep into the earth, as that of cotton, I shall insist upon its accommodation, by providing a soft, deep, mellow bed, into which these roots may penetrate.

"In the second working, the plows should in all cases go before the hoes, and in all lands at all tenacious or hard, let the work be deep and close again, and the middle of the rows also be well broken up at this time. Now the hoes have an important and delicate duty to perform. The cotton is to be reduced nearly to a stand, though it is now rather early to be fully reduced. It is perhaps, best to leave two stalks where one is intended to grow. The young stalk is very tender, and easily injured by bruises and skins from rough and careless work, and it is much better to aid a little sometimes with the hand in thinning, than to spoil a good stand by bruises from the hoe. The cut-worm and the louse are charged with many sins, which ought to be put down to careless working at this critical stage of the crop. The distance to be given I have before stated, and, in the first operation of bunching, this ought to be looked to, and the spaces regulated accordingly. At this second passing over, the hoes must return a little soft dirt to the foot of the stalk, leaving it clean and supported. If this work is well done, the weed will grow on, without any necessity for further attention for some twenty days or three weeks, when the plow should return again. At this time, some plow should be used next the cotton, which will tumble the soft earth about the root, covering the small young grass which has sprung up since the last working, but the plowing should be less close, and shallower than the former working.

"The hoes have much to do in the culture of this crop, and must be prepared to devote pretty much all their time to it, constantly passing over, and perfecting that which cannot be done with the plows, by thinning out surplus stalks, cleaning away remaining bunches of grass, stirring about the roots of the plant, and, if need be, adding a little earth to them. It is difficult, in a treatise of this sort, to say how often, and in what manner, this crop should always be worked, when the character of the seasons, and the difference in the land, must have necessarily so much to do in settling this question. The general rule must be, to keep the earth loose and well stirred; the early workings to be deep and close; and as the crop comes on, and the fruit begins to appear, let these workings be less close, and shallower, keeping the soil soft and clean. It is of great importance to work this crop late, and it should not cease until the branches lock, or the cotton begins to open. I do not consider that it is necessary to pile the earth in large quantities about the roots of the cotton, but think the tendency of all the workings should be to increase the quantity.

SORGHUM QUERIES.

ED. VALLEY FARMER: I was interested and instructed by the Essay in the Jan. No. of the *Farmer* on the culture and manufacture of the sugar cane, but it has occured to me that there are a few things either forgotten by the writer or not made sufficiently plain which I would like to ask him, and see them answered in the *Farmer:* And 1, Should the suckers be allowed to grow, and if so should they be ground with the main stalks? 2, Is the bottom of the "finishing pan" corrugated the same as the evaporator or not? 3, What depth of syrup should be kept in the finishing pan? 4, Is a constant stream of finished syrup passing from the finishing pan to the cooler; if not how is it done? 5, Is it necessary to have the finishing pan fixed so that it can be lifted off from the fire or not? S.

Hallet's Pedigree Nursery Wheat.

[Concluded from March No.]

Among the advantages presented by very early planting are the following:—

1st. The Extension of the Seed-time—The seed-time being made to commence the first week in September extends through that and the two following months. It need hardly be pointed out how much greater choice of opportunity this offers for getting the seed in under favorable circumstances than is presented when nearly the whole work has to be performed in November, which to often proves so wet as entirely to prevent its accomplishment, and hardly ever admits of the whole seeding being preformed either under the conditions, or at the time known to be those most conducive to success.

2nd. The small quantity of Seed required—The small quantity of seed required, apart from the saving effected, enables the benefits derived from the most intense selection on small plots, to be quickly extended over a very large area. Those growers of wheat who either have not the inclination or the leisure to take the trouble of such selection may, at the price of two guineas a bushel, avail themselves at less than the ordinary cost of the seed per acre, of the selector's extreme care and labor, by employing a bushel or two of a Pedigree wheat produce enough in one year to seed their whole farms; and by the annual purchase of one bushel of seed generations still further selected effectually counteract that tendency to degeneracy which remains to a slight extent even in Pedigree wheat, and recommences to take effect upon the selection being discontinued.

3rd. The rapid growth of the plant in its earlier and more hazardous stages—The temperature early in September is generally such as to promote the rapid growth of the plant, enabling it quickly to get beyond the attack of its enemies—in fact it becomes as inaccessibe to them in the Autumn (and of course throughout the ensuing Spring) as ordinary wheat is in the early Summer. One peck per acre planted in September will resist wire-worm more successfully than eight pecks sown in November. Nor is there any danger of the wheat becoming "winter proud" as this is entirely obviated by the small quantity of seed employed, and by its Pedigree property of tillering out flat over the surface.

4th. The time afforded for Replanting in case of an entire failure—When wheat is planted or drilled, as proposed, early in September, the crop is usually either distroyed or perfectly safe within six weeks, as by this time the plants will either have succumbed to the attacks of their enemies, or will have got beyond their reach. Ample opportunity is, therefore, afforded for resowing if it should chance to be required. The utmost risk, therefore, encountered in adopting this system is simply that of losing the seed—one-sixth part of a bushel per acre. How slight this risk is, may be gathered from the fact, that out of nearly five hundred different persons who have planted this wheat during the past autumn (1861), only two have reported destruction of the crop—in one case by excessive drought, in the other by slug.

I do not mean that when wheat is drilled or sown broadcast in the usual way and at the usual time, we cannot obtain any of the advantages to be derived from the repeated selection of seed. On the contrary, I have found that Pedigree alone has increased my crops from 25 to 30 per cent, but the fullest possible advantages of it are to be reaped only where the grain has the opportunity of fully developing the properties it has derived from a long succession of parents, each of which has been so situated as to attain a perfect growth.

The time of planting, however, decides the distances between the single grains: those given below are fixed upon with due provision for casualties.

I would give the following directions for all soils:—Invariably plant only one grain in each hole, as this has been found to produce more than any other number.

The holes to be dibbled 1½ inches deep, when harrowed in, and the following distance apart:

In Great Britain.—In August—9 inches every way—one bushel on 6 acres (this is two months before the usual time). In September—9 inches between the rows, and 6 inches in the rows—1 bushel on 4 acres. In October 9 inches between the rows, and 4½ in the rows—1 bushel on 3 acres, decreasing towards the end of the month to 3 inches in the rows—1 bushel on 2 acres. After October—6 inches between the rows, and 3 inches in the rows, or about 1½ bushels on 2 acres.

My principal object in dibbling is to ensure perfect singleness and regularity of plant, with uniformity of depth. The two latter may be attained by the drill, as may the former also by adopting the following plan. The seed-cups ordinarily used in drilling wheat are so large that they deliver bunches of grains consisting of six or seven, which fall together within a very small area, from which a less produce will be obtained than if it had been occupied by a single grain. The additional grains are thus not only wasted, but they are positively injurious. By using seed-cups, however, which are only sufficiently large to contain one grain at a time, a stream of single grains is delivered, and the desired object, viz., plants from single grains, at once attained. The intervals in the rows will not be uniform, but they may be afterwards equalized by the use of the hoe, if it be thought necessary. These intervals will of course depend upon the velocity with which the seed-barrel revolves, which can be regulated at pleasure by a proper arrangement of the cog-wheels which drive it; but it will be necessary to fix upon the nave of the traveling-wheel of the drill itself a larger cog-wheel than is in common use. I have had these nave wheels made to shift with facility, so that the drill may be easily rendered again available for general purposes. By drilling thus we obtain the advantage of the "broadcast" system also—equal distribution—as we can have the rows as close together, and the grains as thin in the row as we please. The crop should be hoed, as soon as practicable, with Garrett's horse-hoe. If the seed has been sown early, this should be done in the autumn, and cannot be done too frequently, as it causes the plants to tiller and occupy the whole ground before the winter sets in.

TOBACCO PLANT IN FULL BLOSSOM.

From the Iowa Homestead.

ON GROWING AND CURING TOBACCO.

PREPARED BY WM. DUANE WILSON.

The high prices at which tobacco is now selling, is awakening such an interest in this State as to induce many of our farmers to go into its cultivation. That it can be grown successfully in Iowa is fully sustained from the fact that there has been as high as three hundred and twenty-five thousand pounds raised and cured in one year. It is a question with many, however, whether the growing of tobacco should be encouraged amongst us, believing that it injures the land to a greater extent than can be compensated by any profit which may be derived from it, and some are opposed to its growth on moral principles. Notwithstanding all these objections it will be cultivated somewhere, and used in some form everywhere, and many of the farmers of this State think that the evil, if it is one, will not be extended or lessened by all they can grow—at least, they may honorably think that they have a right to share in the profits of its cultivation, and many will strive to do it. That they may do so intelligently, all the essential information which could be obtained readily on the subject is embraced in this article, for general circulation. For much of it I am indebted to the Transactions of the Connecticut State Agricultural Society, believing that the practice in that State would be a safe guide for this latitude. A writer in the volume for 1856 introduces his mode of culture with the following important truths, upon which it would be well for those to ponder who propose entering upon the tobacco culture in this State.

"The attempts that are making to grow tobacco without manure, are, and necessarily must be, mostly failures; other crops may be grown on land not well fitted; we may grow corn at twenty-five bushels to the acre, and get good quality; but tobacco must come up to a certain point, or it is worth little or nothing as a crop. No man can grow tobacco who is not willing to devote all the manure he can get to it, and all the time that is wanted, let what else suffer that will. No natural strength of land seems to be of much account; high manuring, the most careful cultivation, watching close from day to day, neglecting all else where tobacco wants anything done; setting it all the rainy weather, during the season of setting, and carting water if it does not rain at the right time, are all necessary, and must be done; in short, the man who is not willing to make himself a slave to one crop, will not succeed well with tobacco."

It is to be hoped no one will go into the culture of tobacco extensively in this State, unless possessed of the necessary experience, or until he has experimented in a small and safe way. For the latter, the following on its cultivation, &c. is intended as a guide:

PREPARATION OF SEED BED.

Much depends on having good plants, hence care should be taken to have good seed and good seed beds. The best and perhaps the only suitable soil and location, is a well cleared spot in the timber, as the timber gives good and necessary shelter to the young plants. Select a well-drained spot, with a southern exposure, and as soon as the frost is out of the ground, spade the soil up to the depth of three or four inches, then cart on brush and straw, spread and burn them, which must be done thoroughly to kill the small weeds and make the ground friable; give it also a good dressing of old, well-rotted manure, which spade and prepare nicely; spade deep, then roll the bed well, but before sowing draw a rake lightly across the bed, that sufficient soil may be thrown up to cover the seed.

SOWING THE SEED.

In sowing the seed, it cannot well be put in too shallow, provided the light be excluded.—The quantity is, say a common tablespoonful for one hundred square yards, and in that pro-

portion. Mix that quantity of seed thoroughly with two quarts of ashes; the seeds being so small it is necessary to mix them with ashes that they may be distributed more evenly over the bed; roll again, and the bed is done. Those who have no rollers, may lay a plank or planks over the bed, and by tramping upon them effect the same purpose as a roller. It is almost death to the plants to have grass and weeds growing amongst them, and extreme care must be taken to pluck them out when the plant is forming.

MANAGING SEED BED.

When the plants appear, as they will in about six weeks after sowing the seed, water them if the bed is dry—but it must only be done after sundown or before sunrise. There is no plant more sensitive than the tobacco, especially in its early culture. Soft water, or water that has been boiled, must only be used for watering, and the water must be of a temperature that would be comfortable for bathing—in short, the plants must not be watered with cold water. When the plants are taken up, if the beds are hard, water to soften the earth, and that the roots may be wet when transferred to the field.

If the days and nights are cold, glass frames should be kept over the bed until the plants appear, which will bring them up in about half the time mentioned. After they are up, the frames may be dispensed with, except when frost is expected. If the seed is sown very thickly, the plants grow flat and close to the ground.

The Plant and Root as should be set.

KIND OF LAND TO RECEIVE PLANTS—ITS PREPARATION, &C.

The best land for tobacco is a rich loam, with an admixture of sand, of which there is any quantity in Iowa.

Prepare it so that it would raise one hundred bushels of shelled corn to the acre. With such a spot, and care and attention, a good crop of tobacco may be expected. Fall plowed land is best, and cross brake in the spring; then harrow and pulverize the soil well. Lay it off three and a half feet each way, a bull tongue plow being the best for this purpose. Prepare the land about a week before setting the plants. Make a little hill at each cross, in which put the plant, the earth being a little packed around the plant. If plants are set too close, the lower leaves are thin and worthless. If the weather should be dry when setting out, a clod of earth may be placed on the plant to shelter it until the first hoeing. It is best, however, to set the plants when the ground is damp; if it becomes dry, and the sun shines hot, old hay is taken which has been run through a hay cutter; wet it thoroughly, and put a little on each plant, say as much as can be taken up between the thumb and two fingers, which keeps the sun from burning the plants. Its growth will generally throw off the hay in the course of a week or two, if not, it is easily removed. Perhaps a little earth should be thrown upon the hay to prevent the wind blowing it off before it should be removed. If the field is ready, plants may be set out as early as the 25th of May, and to replace those injured or destroyed, as late as the 10th of July.

The Plant as Set in the Hill.

CULTIVATION.

Use the cultivator or horse-hoe, as often as can be done, three or four times, until the leaves are so large that there is danger of breaking them, then use hand-hoe, and thoroughly. Now look out for the tobacco worm, watch and kill them daily; unless this is done they will very seriously injure the crop. They commit their ravages on the under side of the leaf where they may be found after the sun is two hours high in the morning. Great care should be observed in turning up the leaf to look after and kill the worm, or the leaf may be broken off. This is one of the most disagreeable duties in the process of growing the crop, and very disgusting to many.

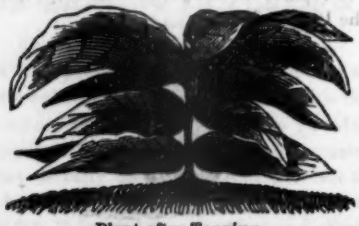
The stalk is topped as soon as there is a general appearance of flowers over the field, and before the seed is formed; if the crop is late, this process is gone through with before many

blossoms appear, taking off about seven leaves, which will leave about fifteen. After topping, the suckers must be carefully attended to and kept closely down.

In about another week the suckers must be attended to again, as also the worms; and look in another week to see whether the same process will not have to be repeated; if so, do it.

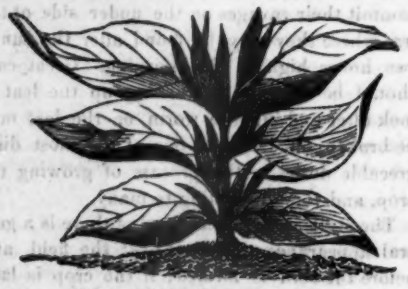
The following cuts represent the plant before topping, and after it is topped, and the plant with the suckers growing.

A Plant ready to Top; place for Topping indicated by b.



Plant after Topping.

Enemies—Besides the tobacco worm, there is another enemy, the cut worm, which attacks the young plant very soon after it is set in the field. The only remedy for loss from the cut worm, is in having a plentiful stock of new plants, and using constant vigilance in re-setting as fast as they are destroyed. The wind and sun are also enemies to the leaf under certain circumstances; our prairie winds may expose the under side of the leaf to the sun, which kills the leaves if suffered to remain upturned.



Plant with the Suckers Growing.

[To be Continued.]

POTATO CULTURE.

ED. VALLEY FARMER: The potato crop has been a failure in this part of Illinois (Odell, Livingston Co.) for the past two years, owing in part for want of change of seed, which I deem as essential as for grain or any other crop.

Of the varieties in our neighborhood, I have succeeded far beyond my neighbors in raising good crops.

The kinds I now have, have been planted several years, commencing with small ones, the larger ones being selected for cooking. As regards raising from large or small potatoes, my experience proves that the season has more to do in the matter than the size of the seed. My plan for raising potatoes is, to select a good piece of ground, and haul out and spread on it a good lot of manure, and plow deep, harrow the ground well, and then with a hoe make a shallow hole for the seed, standing with both feet in the hill, after being made, while I make the next hill, which packs the ground for a bottom, on which the tubers lay evenly when dug, then put three small pieces in a hill, giving the tuber plenty of room to grow, covering with the hoe 1½ to 2 inches deep.

I plow them when two inches high. Before they bloom, plow and hill with the hoe, and have never failed in getting a good crop. I have the Mercer or Neshannock Pink Eyes, blue and white, and a kind I call the Lady Finger, a long white potatoe, an excellent variety to bake and an enormous yielder, a very profitable crop and scarcely ever rots.

EBEN WEEKS.

Experiments in Raising Corn.

A correspondent of the *Boston Cultivator* has tried six experiments in raising corn, taking four rows of corn for each experiment.

The first was a shovel full of stable-manure in each hill, yielding eight bushels of sound corn, and half a bushel of "pig-corn," well ripened.

The second experiment was made with plaster and ashes, one-third of the former and two-thirds of the latter. The result was seven bushels of sound corn, and two-thirds of a bushel of pig-corn, not so well ripened as the former.

In the third and fifth experiments superphosphate was used, with less beneficial effect.

Spent tobacco was used in the fourth, and about two bushels of interior corn were obtained, and about the some amount of pig-corn, of a very inferior quality.

In the sixth and last experiment, night-soil, compounded with loam and barn-waste, consisting of chaff, straw, refuse hay, &c., thus increasing the quantity of manure by measure about four-fold. The result was, the best crop of all, both in quantity and quality, and rating forty bushels to the acre, though the season was not a favorable one for corn.

It is the night-soil that has this precious influence—and is not surpassed, if equalled, by any

other manure. And yet look at the waste of this admirable fertilizer. To get it out of the way, and keep it there, seems to be the chief effort; and people generally succeed in the effort. The experiment above noted, is but a confirmation of what we have repeatedly said about this manure; and we again repeat—add water to night-soil, and apply, and your effect will be immediate as well as immense for the amount of manure used.

SORGHUM.

Ed. Valley Farmer: I received a letter from one of your subscribers, through your hands, in which he complains, and justly too, that I have omitted saying anything in my essay about neutralizing the acid in Sorghum syrup. I certainly did write a paragraph on that branch of the subject, but I either omitted it in copying or the printer let it slip. It amounts to this:

"I use lime water, at the rate of half a pound of lime for every fifty gallons of syrup. I simply make a saturated solution with the water. Saturated solution, means a solution made by dissolving all the lime the water will hold.—This I put into the tub which serves as a reservoir for the juice. The exact amount can only be determined by experience. Some lots will require perhaps not half the above amount; others more. A little excess will not hurt in the least. The flavor will disappear shortly.—The lime should be fresh and pure."

Walshville, Ill. E. F. Newberry.

SOWING WHEAT IN DRILLS.

Some farmers practice this mode of raising wheat. The drills are 2½ to 3 feet apart. The field is thoroughly cultivated, as corn is cultivated in the Eastern states. The yield, it is said, is greater, and the wheat better in quality than when sown. It is certainly cleaner.

It is further said (by Rev. Mr. Smith, as reported by Prof. Mapes,) that the soil will not detoriate. The same authority has raised wheat successfully for sixteen years in succession, the crop increasing from twenty-three to thirty-eight bushels to the acre, *without manure.*

Thus corn will do better if sowed in drills (for fodder) than broadcast.

But why is the drill preferable? Because it gives the benefit of cultivation, which, we all know, is so efficacious in corn. It lets the air and the warmth into the soil, and increases its capacity for absorbing strength from the atmosphere which becomes mixed with it. The sun and wind have a better chance. The roots work with more ease in the soil. These are all benefits.

But it is so easy to sow grain! and so hard to cultivate it! And where labor is worth as much as it is with us—we see at once why wheat is not sown in drills. But, if it pays when all things are taken into account, why not sow in drills?

The idea of raising wheat for an indefinite number of years from the same field yearly, is certainly an improvement on the rotation system which sowed wheat seems to necessitate.

It is pleasant to have your plot of ground in graceful ridges of wheat, and know it will pay—and have the wheat there each season. A man may thus in his garden—if he has a large one—devote enough ground to wheat for his family's flour—raise his "staff of life" as well as his garden vegetables. Try a little plot—in your garden or field. F. G.

Rotation of Cabbage.—"Two crops of cabbage should not be attempted upon the same ground in two successive years, under any circumstances." So says the *Massachusetts Plowman.* This is not our experience nor observation. A friend of ours has raised cabbage for twenty years from the same ground, and seldom failed of a good crop—and yet he has used little manure, the ground being naturally of a deep, rich quality. He laughs at the idea above quoted. The cabbage is doubtless a rather exhausting plant, and requires potash, among other fertilizers. But it does not exhaust a good soil in a year or two, as we well enough know. With cabbage, much is depending upon the season. A wet, cool season will grow cabbage on an ordinary soil, and an excellent crop for many years on a good, rich soil. A warm, dry season will not do this. F. G.

Pike's Peak as an Agricultural Country.

Ed. Valley Farmer: Perhaps many of your readers will be led to ask, What has the experience of three years amounted to in solving the problem concerning the fertility of the soil of a portion of the Great American Desert, and also of the valleys bordering or lying along the principal mountain streams in Colorado Territory.

In the first place, vegetables grow to a remarkable size, and of as good quality and flavor as can be found in any locality in the United States. One would suppose that being at about eight hundred feet above the level of the Missouri river, the seasons would not be long enough for potatoes and corn to mature; but such is not the case. I have seen as fine 8 and 10 rowed corn ripe here as I ever beheld in Vermont, New York or Iowa, although the yield was not quite so large. Potatoes do remarkably well, and the farmers have so far found a ready market for all their produce at reasonable prices, and will from present appearances for several years to come.

I will give you the mode of irrigation and cultivation from time to time. O. S. Templer.

Colorado Territory, Feb. 4th, 1863.

ABOUT COTTON.

ED. VALLEY FARMER: You have an article in your March No. on the culture of cotton which is valuable. The whole of the State of Missouri south of St. Louis lies in a climate excellently well suited for cotton. It seems to me that the directions in the article referred to regarding the distances at which the plants should stand from each other are likely to mislead farmers in our latitude. The writer says the rows should be five feet apart and the plants from fifteen to twenty inches in the row. This may be the best plan even for us, I do not deny but what it may be, but were not these directions written for planters in South Carolina, and the Gulf States where, when the land is good, the plant grows as high as one's hand? I believe it is the truth that the farther one goes South the more room does every kind of plant require. In Southern Illinois scarcely half as many stalks of corn are suffered to grow as in the north part of the State.

They who have raised cotton here since the settlement of the country, have had the rows three feet apart, and the stalks as close together as peas. This has been the women's plan. The men have not raised cotton. My impression is, that the rows should be from three and a half to four feet apart, running North and South, and the plants not less than a foot from each other. I think a better way would be to plant in checks two and a half feet each way, put four seeds in a hill, and let two of the strongest plants stand. I think more cotton can be raised this way. I am sure it can be worked easier.

The real truth is, the best way to raise cotton in this latitude has not yet been ascertained; and it will take some time and much interchange of views to decide the matter. But it has been ascertained, that south of 39°, on light, tolerably fine soil, it is the very best crop, even at ten cents a pound for the lint which the farmer can raise. Seed is scarce—who will double his money by getting a supply from the South? N. C. M.

Union Co. Ills.

SPRING WHEAT IN IOWA.

ED. VALLEY FARMER: We chiefly raise wheat in this section of the country, and the failure of this crop was pretty nigh complete last year.—Hundreds of acres in this neighborhood were not harvested at all. Our Club wheat generally averaged from three to six bushels per acre; and this kind was mostly sown. Newer kinds, such as (Scotch or Canada) Fife, Mediterannean or Tea wheat did decidedly better. These kinds averaged from at least ten to fifteen bushels per acre. But as I remarked before, very little of these sorts had been sown. I am poorly posted in regard to these different varieties of wheat. But little of the old Club (Canada Club) will be sown this spring. The talk is, it has been in use here too long a time to do well. Crops of this kind become poorer every year. Last year, however, the season was not favorable for any kind of wheat. This wheat (Club) has been cultivated here for about eight years. When first introduced it did well; averaged from twenty to thirty-five bushels per acre. Chiefly three different varieties of wheat (at least they have three or four different names for it) will be sown this season. I do not know whether these different names denote different kinds of wheat. Can you or some of the readers of the *Valley Farmer* give us some information on this subject. The question is, is Tea Wheat, Mediterannean and Ozee wheat one kind, or are they three distinct varieties? Some say, all three names denote but one kind of wheat, while others hold the contrary. All three have beards. I have compared what is termed Mediterannean, with the Tea wheat, but could find no difference in the size or shape of the grains. C. BENEDIX.

Le Claire, Scott Co, Iowa.

Premium Crops of Clover Seed.

The Ontario County premium crops of clover seed, as reported in the last "Transactions," were over four bushels per acre—in the highest four bushels and eighteen pounds. Both were seeded on winter grain, and the first crop of hay cut the last of June; the second saved for seed. Some farmers think a greater profit can be made from this crop than any other; but it is found very exhausting to the soil.—[*Ex.*

This is curious, that a crop of clover should be "very exhausting to the soil;" when it is well enough known that clover derives a great share of its strength from the atmosphere, and its large roots afford abundant manure.

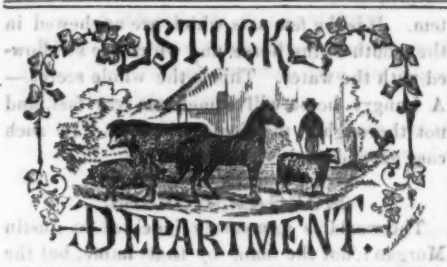
Raising clover, is deemed in the best clover countries a means of enriching the soil. It is so thoroughly understood and practiced. If plowed in, the green stalks afford an excellent coat of manure; and the roots alone will add to the former estimated strength of the soil.

We have raised considerable clover seed, and seen it raised in abundance around us; and we know whereof we speak, when we say that clover does not exhaust the soil, i.e. in raising seed. There is always some loss of the stem before it is fitted for the barn, all of which goes to the soil. But an indispensable condition is, that plaster be used. It is not pretended to raise clover seed in New York and other States in the same latitude, where a business is made of it, without the use of plaster. Without it there is usually a failure—in part at least—of the seed crop, and also a great diminution of straw. Clover is one of our most remunerating herbs. F.G.

RAISE YOUR OWN COFFEE.—*Ed. Valley Farmer:* The papers for some time past have been full of substitutes for coffee.

Last spring, from a suggestion in the *Valley Farmer*, I planted enough Ochre or Gumbo to raise over a peck of seed. We have been using it instead of coffee regularly for more than a month, and think it equal to the real Rio. I am certain it is much cheaper. It is prepared for use just as the real coffee is, and drank with cream and sugar. Try it.

ONE WHO HAS TRIED IT.



[Written for the Valley Farmer.]

VETERINARY DEPARTMENT.

By Geo. H. Dadd, Sen., V.S., Chicago, Ill.

Strangles in Horses—Its Nature and Treatment.

Very few horses escape this affection; it is peculiar to the equine race, and at some period in the life of the animal is sure to make its appearance.

Strangles develops itself as an abscess about the region of the lower jaw, in the vicinity of its angles. It first commences as a small, hard tumor, which gradually enlarges as the pus or matter accumulates. So soon as a soft spot is discovered, an incision is made into it, and the matter escapes.

Strangles is usually ushered in with symptoms of ill health; soon a stiffness of the neck is observed, and a slight discharge from the nose sets in; the animal refuses food, and the act of swallowing water elicits symptoms of pain.—Sometimes the matter burrows around the throat deep seated, and so presses upon the larynx as to cause suffocation or strangulation: hence, the name "strangles."

Treatment—So soon as the tumor is discovered, a flaxseed poultice should be applied to the region of the throat and jaws, for a few days. This will have the effect of causing the abscess to point, as the saying is. When a soft spot is discovered, it should be punctured, and an orifice of sufficient size should be made to allow a free discharge, which will afford the animal much relief. A few doses of tonic and alterative medicine should be given, and the diet should consist of thin oatmeal gruel, with an occasional drink of hay tea.

It may happen, after the matter is all discharged, that an enlargement of the glands and parts about the upper part of the neck remains. In that event, I recommend that the region be anointed once daily with a portion of the following:

Spirits of Camphor,	1 pint.
Vinegar, -	½ pint.

On the Formation of Sugar in the Liver of Animals.

A late number of the *British and Foreign Medico Chirurgical Review* contains the following remarks upon the production of sugar in the liver of the horse and dog, as the results of certain experiments in reference to this inquiry, made by C. G. Lehmann, in Germany, and by Claude Bernard, in France. Lehmann's experiments were made partly on horses, killed five hours after the last meal; partly on dogs, of which some had been killed in the fasting state, others five hours after a meal of raw meat, others after one consisting of boiled potatoes. The blood of the portal vein of the dogs killed in the state of fasting, and of those fed with raw meat, contained no sugar; that of the horses, and of the remaining dogs, namely, those fed with potatoes, only a small quantity; while the blood of the hepatic vein exhibited, in all cases, a very large amount. Lehmann attributes the origin of the sugar formed in the liver, in part at least to the fibrin and albumen, the proportion of which is diminished in the blood of the hepatic vein. His repeated experiments confirm the fact pointed out by Bernard, that the arterial blood is usually free from sugar; that only when the venous blood in the right ventricle contained three per cent of sugar or more, as in cases of diabetes mellitus, a part of the latter passes into the arterial blood.

Claude Bernard took the liver of a dog, fed exclusively on meat, immediately after death, by section of the medulla oblongata; he washed it out by a continued stream of water through its vessels, so completely, that it was quite exsanguineous, and that the decoction of a piece of it did not any longer yield a trace of sugar. When he examined the remainder of this liver after twenty-four hours, he found it to contain a very large amount of saccharine matter.—From this simple experiment, frequently repeated with the same result, Bernard concludes, that the sugar is not formed as other physiologists have suggested, by a kind of catalytic action, exercised by the glandular tissue on a constituent of the blood while it circulates through the liver, but by a metamorphosis of a substance contained in the tissue of the liver itself. The same experiment shows that this substance, which is to be transformed into sugar, is insoluble in water, in alcohol, and in ether; the transformation into sugar is commonly effected within twenty-four hours; that it is accurated by pre-exposure to atmospheric air, and that, on the other hand, this faculty of undergoing the change in question, is occasioned by the process of boiling. Claude Bernard remarks, that in the state of health this substance is constantly reproduced in the tissues of the liver, and as

constantly afterwards transformed into saccharine matter.

Fatal Epizootic Disease Among Horses in New Jersey.

Epizootic affections are so named from the fact that they affect horses, or are upon horses over a large extent of territory; but when a malady of this character only affects animals in circumscribed localities, it is termed enzootic or among horses.

Unless this disease shall ultimately have more extensive ramifications, I should be inclined to consider it as an enzootic affection.

The disease seems to affect the organs of respiration, assuming a low, typhoid form, of a very prostrating character: and such forms of disease are like cholera, plague, anthrax, &c., very apt to prove fatal in spite of the efforts of the very best physicians.

During the prevalence of the cattle epizootic in Massachusetts in 1860, a number of the affected animals were treated, and very few, if any, ever recovered.

I believe the facts are, that such affections steal on in a slow and insidious manner, and are very firmly seated in the system ere they become visible to ordinary observers, hence the great odds in favor of death.

The surgeons who have attended cases occurring among horses in New Jersey, contend that the affection is malignant laryngitis; if so, there is very little hope of saving an animal, especially when the disease involves both lobes of the lungs as well as the respiratory passages: yet the only rational mode of treatment is to sustain the vital powers by nutritious oatmeal gruel, tonics and stimulants.

It is probable that the operation of tracheotomy might prove successful in affording the afflicted animal some relief, when paralysis of the nerves of respiration occur, and the animal is in danger of asphyxia or suffocation in consequence.

Should I be called upon to prescribe for a case of the above character, the treatment would be as follows: Swab and gargle the throat by means of a sponge with Pyroligneous acid, and administer every two hours four fluid ounces of fluid extract of ginger.

Water after Oats for Horses.—It is said water should not be given a horse after eating oats; that the oats, some oats are found in the dung. This is true, we have seen it. But it is not the water in the stomach that interferes with digestion—that is soon taken into the system. It is the few oats which are unchewed in the mouth of the horse, and which are swallowed with the water. This is the whole secret.—A hungry horse will sometimes eat fast, and not thoroughly masticate his food. In such case ground feed is preferable.

MORGAN HORSES.

The world is immensely indebted to Justin Morgan: not the man, by that name, but the more profitable horse; for the world has been benefitted by the blood alone of this horse. It is justly popular, and will yet cover the continent.

The various breeds of horses, have, all of them, different qualities, with a preponderance generally of the poorer qualities. Not so with the Morgan horse. For very nearly all the uses that a horse is calculated to serve, the Morgan horse answers the purpose. No other breed does this. The very best qualities are found here in perfection—spirit, faithfulness, tractability, endurance. The size is not fitted for heavy draught. This, however, is not a fault, as the world is full of heavy, plodding beasts. But for what answers best the term horse, there is nothing equal to the Morgan. I know many will not assent to this, who have other breeds to recommend.

We have said the Morgan horses are destined to cover the continent. They are already found in nearly all parts of the country, including California. And this is as it should be. They are high strung, and at the same time gentle, with a friendly, becoming eye, though full of mettle when occasion requires; compact and nervous, perfect in organization, and freer from the liability to defects than perhaps any other breed.

With these facts, is it wonderful that the Morgan horse is popular. Then why breed from another? If not always as showy, the blood is there, and that will give you a preponderance of the good qualities. But the Morgan horse is showy, handsome. Secure him. F.G.

Milking.—Some people hold that it is better to milk once a day, than twice or oftener. That such a thing should be entertained is almost remarkable. Whenever we wish to dry a cow, we milk her once a day; if difficult to do it, then once in two or three days. This ought to satisfy any one. Cows that give much milk, should be milked three times rather than twice. We have known this to be the most beneficial plan. Milk often, where there is plenty of milk, but regularly. It is as necessary to milk regularly as feed regularly.

SHEEP IN THE WEST.

Sheep will leave the lowlands and go to the hills. This is because they love dry places. Dampness always injures them.

The hills of New England, then, are just the thing for sheep; and it is here where they flourish to perfection.

But how about the prairies? Precisely as well. They need but be dry. As to air, there is enough of it.

Some people seem to think a hill is natural for sheep: a miserable mistake. They climb the hills because they can climb them better than other stock; and they seek them, as we have said, because they find security there from the dampness below. But a sheep will do as well on the prairie as on a hill; and even better as a general thing, because the prairie affords more feed in the summer, and more fodder in the winter.

Shelter is the grand thing needed on the prairies. And this sheep seldom get here. They need it here more than anywhere else. We need not say why, as all know the prevalence of winds on the prairies. Especially in raising lambs is this necessary. Unless shelter is provided for ewes at such a time, there is no use in trying to propagate sheep, one of the principal profits of sheep husbandry.

As there is food enough, there is no excuse for having feeble ewes. Feeble ewes produce feeble lambs. There is grass enough on our prairies to have sheep in excellent order constantly. In this respect the West has the advantage over the rest of the world.

Shelter, then, seems the only lack. If there are others, they are more or less common to all localities.

It is most gratifying to see the West wake up on the subject of keeping sheep. Especially since the war began is there a wide-spread inquiry, and the increase in so short a time is remarkable. It will soon be known that the West is a great sheep country.

One word more, and this is perhaps the most important: The war, as we have said, has stimulated us on the subject of raising sheep. This is the true spring, and shows the sagacity of the West. The war has raised the price of wool. There will be a demand as long as the war lasts, which no one will dispute. But most of all there will be a demand after the war. This is inevitable. The prices will continue high many years after the war has closed.

Shall we doubt these things. There can be no failure—only in our own neglect: neglect, first, in not engaging in the enterprise; second, in not taking care of our sheep, which prairie habits are very apt to develop. We are so apt to leave everything to nature.

As to the breed of sheep, the Cotswolds or the long wooled are probably the best at the present time. Coarse wool will be in greatest demand. The breed is hardy, and yields largely, both in wool and mutton. But get sheep, any sheep, rather than none.

CARROTS FOR HORSES.

In some places carrots for horses, is notorious. We have seen enough of this root to know that it is generally beneficial. From what experiments we have tried and seen tried, we must give the preference to carrots over other roots for horses and colts: not indeed as a main reliance—there is not enough of strength or muscle-producing property in any root to warrant this. But a peck of carrots a day to a horse, we are persuaded is an advantage: we think the root cannot be better used. For milch cows, we are less in favor of carrots, as they impart their flavor to butter, though they also impart their color, which is an advantage. Carrots for horses, has long been our motto. It is our opinion still. And there is little difficulty in raising them. Early planting, a good soil, and clean cultivation.

FACTS FOR FARMERS.

For wool, get Merino sheep.

If you have short pasture, Merino sheep are best.

For lambs for the butcher, get the English breeds. Have your lambs drop in February or first of March. Sell in May or June. In the Eastern market, such lambs are sold for five to seven dollars per head. The ewes are then put to good pasture, and sold in the fall for mutton. Fortunes are made in this way and always great profits.

Vermont is a great sheep State. There sheep were first made profitable; and there they are now the most profitable. Sheep in this State average five pounds of wool; some have gone as high as twenty and twenty-five pounds of wool to the head. The people of Vermont improve their land and their pocket by keeping sheep: the State prospers in consequence.

The stock of moderately-worked stallions is better than if not worked at all. It improves the muscle, and all improvements are communicated.

Pears are raised in California weighing over three pounds.

TO CURE HOG CHOLERA.

Take sulphur 2 lbs., madder 2 lbs., saltpetre 1 lb., black antimony, ½ lb., mix. Give tablespoonful twice per day in milk, gruel, or anything they will eat it in. If too far gone to eat, drench them with it.

Another—As soon as the hog is attacked, give a teaspoonful of arsenic, repeating it twice a day for two or three days.

Another—Put into a strong bottle 1 teaspoonful of chlorate of potash, and 1 ounce each of muriatic acid and water; cork tight, and keep in a dark place. Of this add two teaspoonfuls to a pint of water, and give to each in his food 2 or 3 ounces at a time, repeating it frequently.

To destroy the infection in a pen, wash the pots with a strong solution of sulphate of iron or chloride of lime, and also sprinkle it about the pen.

Another—Equal portions of finely powdered ginger and allspice; mix it with some kind of ground feed, giving 2 or 3 tablespoonfuls 3 times a day, to a full grown hog.

Give the preparation as soon as any symptoms appear, and continue it till a cure is effected.

G. J. Cowgill.

What Stock Should We Have?—Not any kind, gotten at random: but this is the way we get our stock; and hence we have a miserable collection. With a little trouble, we can get almost any kind we wish.

But what kinds of stock should we have? That depends wholly for what we want them. If for milkers, the Alderneys are the best. The old native stock of the country is also good. For working cattle, there is of course nothing equal to the Devons. For beef, we know the heavy quartered Durhams are just what is wanted.

For wool, Spanish Merino is the thing; and for mutton, the South-Down or Leicester.

For horses, there is the Morgan, which will answer all purposes, except heavy draught. For light, airy teams, the Messengers are good; and the Black Hawks for mettle.

A little trouble, a little expense, will set us on the right way.

Worms in Pigs.—We learn from Mr. C. Harvey, of Carmi, Ill., that a number of his choice pigs have been sick with something like the thumps. He opened one which died, and found, as he thinks, the cause of death to be worms. He found 135 worms, the shortest 4½ inches long, and the longest 9½ inches long. There were 10 in the throat in a knotted condition. He commenced giving his pigs copperas—sulphate of iron—and they all got well. He does not state what quantity of copperas he gave.

Treatment for Crib Biting Horses.

I will relate my experience with this disease. I once had a horse that had thus been troubled for a year and a half and became so bad that when plowing it would "crib" every time it came to the fence. It was impossible to keep him in good condition. Thinking it merely a habit, I adopted the following remedy:

When it came time to keep it in the barn I enclosed the front and sides of the stall so that there was no edge for him to get hold of (a horse never cribs unless he can get something between his teeth). It was tied overhead and ate its hay off the floor, and its grain from a box that was removed as soon as it had finished eating and never permitted to crib unless some time when away from home. The next spring when I sold it, it was so nearly cured that it would gnaw the *fence* for half an hour without cribbing. I think the same treatment for a while longer would have effected a complete cure. As it was, great benefit was derived at no cost beyond the trouble of taking the box away when done eating.

M. E. White.

Though great benefit may be derived while the treatment continues, we very much doubt if a permanent cure was ever effected in this way.—[*Prairie Farmer.*

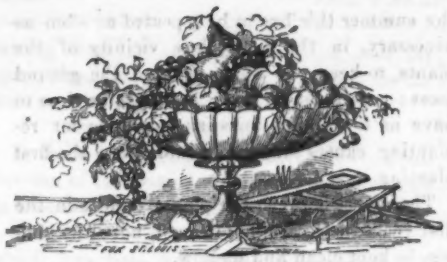
Stock and Crops in Kansas.

Ed. Valley Farmer: I take this opportunity for the first time in your paper to say, that we have had one of the mildest winters ever known in Southern Kansas. A large proportion of the stock will winter on the range without any attention or fodder. This country is well stocked with cattle, horses and hogs; but there is yet a lack in the supply of sheep, which our farmers seem determined by good husbandry to improve; our wheat is now looking very fine, and we have a breadth of land sown three times the amount of any year previous, and we have no doubt, and that from experience, that our soil and climate is a sure guarantee for a wheat crop. Let me say before I close, what has been said many times before, that this section of country for the purpose of raising sheep, cannot be surpassed. I am acquainted with this branch of farming in nearly half the States of the Union. I will give any information desired on any branch of farming within my power so to do, on being addressed by letter.

Marmaton, Bourbon Co., Kan. E. B. Norcross.

Cure for Red-water in Cattle.—The *Maine Farmer* states in reply to a correspondent, that one tea-spoonful of saltpetre, one tablespoonful of salt, and one tablespoonful of sulphur, well pulverized and mixed together, has never been known to fail of curing ordinary cases of this complaint.

Feed.—Feed stock just what they want, and no more. They need rest between times. Constant feeding is not good. In this way much feed will be saved.



HORTICULTURAL.

FRUIT GROWING.

One of the greatest evils of an orchard is, overbearing. This sounds paradoxical. But it is true. Innumerable are the trees that have been killed by a too generous crop. The limbs are bent, and the circulation interfered with; the tree is exhausted and dies from the strain. How many beautiful plum trees have thus gone the way we desired them not. Especially is the plum liable to this mishap. It is on this account that some trees bear fruit every other year. An over-crop one year, prevents a crop the next.

It should be a delight to keep the branches of your trees trim, and so thinned out that the sun reaches every apple. It is the sun that perfects the flavor. In such a case, good pruning—there is but little difference in the size and condition of your fruit. If one is good, they all are good; if one is large, they all are large; if one keeps, they all will keep.

But—it is not enough to prune the branches; you must lessen the blossoms. Too many blossoms are generally a failure; they defeat themselves. Trim them, and nature will thank you in an increase of your fruit.

Keep your trees. Do not let them keep themselves, for they will run riot, and run themselves out. Such are to be found abundantly in the older States—wretched, miserable cumberers of the ground, the result of gross neglect.

"But you carry this matter, like many other things, too far," says one, who is pretty sure to have such a crow-nest orchard, or one forming. But, Mr. Fault-finder, do you not know that the finest and largest apples are always found on the outward limbs, those extending farthest into the air? And do you not know that the little, wrinkled, bitter fruit is always found—always, in the inside or shade of the tree? You believe what you see. And this fact you can't deny.

Further, young trees always have fair fruit. It is because there are few branches, and these are healthy and open to the sun. You cannot deny that the sun gives color and flavor to fruit—neither can you deny that it gives size. All this is evident, if you ever have a thought on the subject. There is too much sneering at fruit knowledge.

Make a pet of a tree, as you would of a sheep or a horse, and see if there will not be an improvement.

[Written for the Valley Farmer.]

FRUIT DISTRICTS OF ILLINOIS.

During the last few years, the subject of Fruit Districts has attracted some attention in our State Horticultural Societies. In States presenting a wide range of soil and climate, it has become manifest that the experience of an orchardist in one section is often directly at variance with that of one in another; and a due regard to valuable results has led men to seek the best method of reconciling these contradictory facts by ascertaining the causes of the difference.

These causes may be classed as two: 1. Soil. 2. Climate.

These might be sub-divided. The soil is modified by geological formation; the absence or presence of wood; the washing of storms or streams, and the effects of culture. Climate is ameliorated or the contrary by the presence or absence of shelter (of woods or hills), water, &c. But doubtless the most important modifier of fruit culture is geological formation, and it is to this I wish to call the reader's attention and future reflection by placing an attempt or two in this direction before his consideration.

At the late meeting of the Ohio Pomological Society, a division of that State into the following fruit districts was made:

1st District—Lake Shore and south-ward in the north-east. Sandstone.

2d District—Lake Shore, and south-ward in the north-west. Black Swamp.

3d District—Eastern and central. Coal measures.

4th District—Central and western. Drift on limestone.

5th District—South-western. Blue limestone.

This, I have been informed, was made by an intelligent and well posted body of men, and as a general division promises well. So I am informed by competent authority.

I have been favored by a leading geologist of Illinois with what he terms a crude attempt in the same direction for Illinois, which is as follows:

1st District—Magnesian Limestone. The Galena region.

2d District—Drift on Limestone. The north-east region, north of coal fields.

3d District. Drift on Coal Measures. The Coal field of central Illinois.

4th District Loess—The region south and west of coal fields and on the great rivers, including also occasional tracts in coal field.

5th District—The sub-carboniferous soils of Southern Illinois, predicated on millstone grit, &c.

This gentleman places these in the following order as regards their capacity of fruit producing: 4th, 5th, 1st, 2d, 3d. The 5th and 1st differ little in their fruit-bearing capacity, but the superior climate of the 5th gives it the precedence over the 1st.

The superior soil of the State of Illinois, according to this, for fruit-growing, is the Loess, which I take to be the white soil extending from the Alton and Terre Haute R. R. to about the 38th parallel, and the bluff formation along the Mississippi, Illinois and perhaps other great rivers of the State.

It is probable that an examination of Prof. Swallow's Geological Report and other facts within the reach of Missouri fruit men, might furnish the material for a similar districting of Missouri.

Farmer Freeman.

[Written for the Valley Farmer.]

Treatment of the Vineyard the First Year.

By Dr. Louis L. Koch, Golconda, Ill.

Like all that belongs to animal and vegetable life, a careful treatment the first year is indispensable to the grape vine. Its effects will be felt for the whole period of its life afterward.—All trouble and expense given that way will be richly rewarded, and gives, besides, a thrifty growth, not seldom the third year after planting, on the strong growing vines, more grapes than another vineyard that has been treated with negligence in five years.

The treatment of the vineyard that is to come up to the above described standard, is very simple and easily comprehended. Of all the sprouting eyes, of which there are often many on one vine, only one must be allowed to remain. The functions of life which are disturbed by transplanting, are only just sufficient to lead to this one shoot the necessary vitality.

In the first months of spring good care must be taken to have, after every heavy rain, those eyes laid bare again which may have been washed underground, and the solid, beaten ground stirred as soon as the ground is in a workable condition; this is done with a small, sharp hoe, which runs to a point. In the course of the summer this has to be repeated as often as necessary, in the immediate vicinity of the plants, to keep the weeds off and the ground loose; care must be taken at the same time to have as few plants miss as possible; for re-planting causes far more trouble than the first planting.

The spaces between the plants require in the first years little care, but it must, notwithstanding, be kept clean and mellow.

As a recompense for the expenses, if desired, some low growing plants, such as strawberries, dwarf beans, &c., may be planted in between the rows the first two years after planting. After that, the roots of the vines have generally run through the whole surface of the soil. They would consquently be robbed of part of their subsistence by between-crops. They would also be hindering in the work which must now so frequently be done during the summer, and by which it can hardly be avoided to tramp on the crops grown between.

When the vine has reached the height of from one to two feet, and is no longer able to keep upright by itself, a stake about six feet long is driven into the ground behind the vine, otherwise the roots will be injured. To this the vine is tied loosely as often as necessary. Keeping the vine upright during the growth is highly beneficial to the vine; while, if it is allowed to grow in its own way, the flow of sap will seek an exit through the lower eyes by suckers, which draw the nourishment from the plant, as they have to be cut away the following fall anyway. In consideration of this, in the course of the first summer, the suckers (sprouts) from below, are to be removed from time to time so as not to injure the eyes next to the stem of the vine. By this, the vine will absorb all the vitality and attain strength and vigor, which I could so far not bring about by any other treatment. All this without particular interruption I carried out to the first fall.—The young vineyard presents a very cheerful and hope inspiring aspect.

Before the advent of heavy frosts, say the middle of October, the vines, without regard to the number of eyes on each plant, are to be cut down to within two inches of the ground. This must be done with a sharp knife, not with the favorite vine shears. This bruises the vine too much, and often injures the upper part of the vine down to some distance.

The small stakes used for marking, mentioned in a former article, can be used as a good protection for vines which are not hardy, by

driving them into the ground slanting over the grape vine. By this the work necessary for the first year is ended.

TREATMENT THE SECOND YEAR.

In the second year, as far as regards the cultivation of the ground, the same rules should be followed as recommended for the first year.

As soon as vegetation commences, the spur which has been left in the fall pruning will throw up many sprouts. I leave all these undisturbed until there is no more danger of late frost. This is here about the middle of April; after that I remove all the weaker sprouts and leave only the strongest one to receive all the vitality of the plant. The rubbing off of the superfluous sprouts has to be repeated as often as necessary.

If the work of the previous summer has been conducted well, and the soil does not belong to the very poorest, this one vine will grow vigorous, and generally over-grow the stakes six feet high.

The sprouts are this summer only removed up to the calculated height of the future trunk (stem), that is, about one and a half feet from the ground, and thereby treated like old wood. Up higher (that is the stem) the sprouts (branches) are not touched before the fall pruning. These (the branches) are as often tied to the stakes as necessary. If they grow too thriftily, they must be pinched back. In this, the second fall, if the plants have progressed well, they are cut back to within one and a half feet from the ground the desired height of the stem, as before mentioned, or perhaps a few inches higher.

An exception in this treatment may be made where, as was the case in my vineyard planted in the fall of 1859, it attains an uncommon vigor and strength. My plantation of 1859 as well as that of 1860 is on the ground of an old orchard which I had rooted up; the ground seemed by no means rich, but I had, notwithstanding, trouble to keep my vines to the stakes.—Many broke down by their own weight, and I had much trouble to keep them in order. Taught by this, I cut the most vigorous vines of my vineyard of 1860, now in its second year, back to one and a half feet from the ground the height before mentioned, in the month of May; at the same time I removed all the sprouts excepting the two uppermost ones; the part below the two uppermost shoots was treated like old wood. These two shoots, now receiving all the sap of the vine, made, with few exceptions, two fine, strong vines, which, on account of their vigor, I cut both to four eyes in the following fall. In addition to these I had even to cut spurs, so that the vines planted in 1860 had, after the fall pruning of 1861, the appearance of four-year old plants, which accordingly gave in 1862, that is, in the third year after planting, a crop, without in the least retarding the growth of the vines.

This should only be done in extraordinary cases, like the one above mentioned. In other cases only the first mentioned mode of pruning should be adhered to.

A further variation from this rule may take place if the grape vine is tender and needs protection in winter. This can only be done by laying the vines down to the ground. In this case, the one and a half feet high trunk would be too inflexible to bend to the ground, for this reason the vines are cut back to within three inches of the ground, the second fall after planting. The following spring there are two vines raised from each one of these stumps, which will afterward form the trunk (stem). In forming the shape of the grape vine, it must be made to incline to both sides, and in this way be enabled to lay down large vines with all their branches. That tender vines need protection the second winter, and that this protection has to be repeated every winter, is self-evident.

SOIL FOR FRUIT TREES.

Great depth of soil is the first consideration; richness, the second. This is sufficient; then plant your trees. No manure will ever be required in such orchards. This is the case with ours, an orchard of forty-five years old, and unexceled in wood or fruit, and yet no manure has ever been used. There seems no end to the depth of the soil, which is an alluvial, and rich. But all orchards cannot have such a soil. Sometimes it is very shallow, not over twelve to eighteen inches in depth. Sometimes the soil is hard; sometimes there is too much clay; sometimes too much sand; and sometimes there are other impediments. But the principle should always be kept in view, which is depth, fertility and mellowness. Get your soil, then, as deep as you can; make it rich, if poor, by manure; cultivate it thoroughly. If there is a hard-pan, or a bed of clay a foot and a half or two feet beneath the surface, let it not discourage you. What depth of soil there is, cultivate it; and the roots of your trees will spread over this soil to a wide extent: they will not penetrate the hard undersoil.

Trees have been known to do well in soil a

foot in depth. They will do better in a foot and a half: better still in two feet; and best of all in an unlimited depth. The difference is: in a shallow soil, the roots will take a horizontal direction; in a deep soil, all directions, and consequently a better growth of root, and a better yield of fruit, left to their own free range.

But a poor soil *must* be cultivated, or there is no use in setting out trees. You may as well dispense with your trouble as to bother yourself with wretched soil.

When your trees are set in shallow soil, top dressing may now and then be resorted to, as the roots lie near the surface, and will receive its benefit. But for deep soil, where few or no roots are near the surface, your manure is thrown away. F.G.

GRAPE VINE FENCES.

Ed. Valley Farmer: Such an idea as grape vine fences could, I think, only emanate from so fertile a brain as Dr. Schroder's. Do you, or any of your readers, really believe, that a fence could be made from vines to turn cattle or anything else? It is simply ridiculous to suppose that any honest cow from Missouri, or any other State, could be turned from full intent on corn or anything else, by grape vines. In the first place, such a fence could not be raised; in the second place, it would not do any good if it could be grown, as our cattle would not want any better fun than to chew up and trample down the vines; and, lastly, it would not last, if it was grown, as we all know that old vines will often die down to the ground and then rot very soon. Please do not, as yet, get your casks ready for the wine to be made from fences, as you might be slightly disappointed. I should like to see the Dr.'s grape vine fence, for surely he must have one, or he could not speak so positively of their success. Has he not perhaps like Mr. Prince, imported a vine through the spirit of his father, from the planet Juno, especially for fences? Perhaps the Dr. has some cuttings for sale of the celebrated fence vine. If so, I would like to purchase some, as among about one hundred and fifty varieties of that fruit, with which I am acquainted, I cannot think of one which would do for that purpose. But as a substitute for the Dr.'s fence, I will try and tell your readers how they can make a very pretty edging to a long walk in a fruit garden or vegetable garden. This is done by planting grape vines say six feet apart on the side of the walk. Drive cedar stakes into the ground along the row of vines, so that they are a foot or eighteen inches above ground, saw their heads off smooth, and nail a lathe on the top or draw a stiff wire over them. Train your vines to two arms, to begin even with the top of the trellis, and tie one of the arms, on each side of the vines, down along the trellis, so that it meets the cane or arm of the other vine. If you choose a slow grower, like the Delaware for instance, which would suit admirably for that purpose, you will have a very pretty sight all summer, your fruit hanging like a garland along the low trellis.—This is not meant to turn the cows, or make a fence, but merely to please the eye, and also the mouth; and I think if your readers will try the experiment with some slow growing variety, which will not rot, they will be pleased with it.

George Husmann.

FLOWER BEDS.

To cultivate flowering plants to the best advantage, requires as much care in the selection and preparation of the soil as any other crop.—No one would expect to grow a crop of cabbages in soil over-run with roots of trees and shaded continously by their dense foilage; yet how often do we observe flowering plants placed in such circumstances, producing a few meagre flowers the early portion of the season, perhaps, and dwindling and dying as soon as a few dry sunny days occur, Most summer flowering plants blossom on the points of branches, and therefore to produce a continuance of flower, there must be a continued healthy and vigorous growth.—It is true there are some flowers adapted to shade, like the fuchsias, daisies, &c., and these should be selected for such positions. Heliotropes, and some of the geraniums do well where there is sun an hour or two per day.

Select an open exposure where the sun will have free access to the plants, dig the ground very deep, and dress heavily with thoroughly decomposed manure, so that the roots may have some supporting resort when the surface moisture fails.

A small circular or oval bed ten or twelve feet in diameter, properly prepared and planted with flowers from pots, will produce a continued mass of flowers even in the driest summers. In arranging the plants, there is much latitude for taste, and very striking combinations may be secured.

For example, in a circular bed, a cluster of four plants of white roses, as Madame Bosanquet and Souvenir de la Malmaison, may be set in the centre, surround these by a circle of Peruvian heliotrope, next a zone of scarlet geraniums, and finish with a margin of white verbenas. This would be a very pretty bed, especially if cut out in and surrounded by grass. Of course this is only one of the many modes of arrangement which may be adopted, but it illustrates our meaning.

Rose beds are much more beautiful and satisfactory, when only a few well-known, hardy, and continued blooming kinds are employed, than when planted indiscriminately, with robust and tall growing sorts crowding those of more

delicate growth. In larger yards, where several beds can be made, there will be a better opportunity for a display of this kind of cultivated taste.

There are few ordinary gardeners who seem to recognize anything beyond making all look clean and smooth with the spade or rake, hence ladies who wish to have fine flower beds, must study an arrangement for themselves, and instruct their gardeners how to proceed.—[*Germantown Telegraph.*

TRANSPLANTING.

This is generally bunglingly done, and almost always hurtfully to the tree or herb. The process in itself, however, is not hurtful. The change is rather an advantage, so far as the mere change is concerned. But why it is, we do not know.

To set out a tree properly, is to set it as near as it grew in the nursery as possible. To this end, give the ground (hole) the general form of the roots. If the ends of the roots extend downward, make a cone in the ground; if the roots are flat or horizontal, have the bottom of the hole level. Then apply rich, mellow soil—never manure—much less rank manure from the barn-yard—and pack well, as solid as you can without injuring the roots; that is, without tearing or bruising them. Let your ground and your packing soil be neither too dry nor too moist: especially avoid wet.

You now have your roots in a natural position, in rich, mellow, moist soil, and there is nothing to hinder an immediate growth.

WILLOW FOR HEDGES.

We have seen this recommended. It may have its virtues; but the Osage and the Thorn are considered preferable. We have seen the native Thorn side by side with the imported. The native grows rapidly, and forms a huge hedge. Where such a one is wanted, this is the plant. The Willow we have never seen succeed, or indeed used, on dry soil. It is a water-loving plant, and will grow well only in wet places.

But there is one thing for which the Willow is unapproachable; as a pond hedge. It has this advantage; that it will grow rapidly. In a few years you may have a hedge. Further, in a few years, this hedge may be made impenetrable—impenetrable to all thievish boys, who, in their dishonesty, will carry off your fish if they can. The Willow is a bar to them.

Besides; the Willow is graceful. Moreover, it is full of food for your fish. The Willow is the home of insects, and these drop into the water and afford the rarest of food.

Plant your willows close, a foot or two apart, and cut back. In this way you will, in a few years, have an impenetrable barrier to all fishing thieves. Then let grow. What lack there will be of limbs below, will be made up by the increase of the stem.

A pond, surrounded by a hedge well grown, will afford food enough for your fish pond if it is stored with trout, which, during the summer, get their food from the surface; and a little of such food will keep them in condition.

It will be said the West is not suited to trout. This is as great a mistake as that the West is not suited to cold water. Where there is a cool spring, trout can be kept, if it is in the tropics. Make a pond, and let your cool water have direct access to it. F.G.

THE CONCORD GRAPE.

"For market purposes and for wine, we think that the Concord grape stands unrivalled among American seedlings. And for these reasons, the habit of the vine is remarkably healthy and vigorous, and for the early bearing of full and abundant crops we have never seen its equal.—When we add to these qualities its entire exemption from disease—its early and uniform ripening—its magnificent appearance, both of bunch and berry, and its very good quality, we think we have not gone too far in assigning to it the above position."—[*Country Gent.*

"No grape that we are acquainted with, bears earlier, or even so early, as the Concord. It frequently bears the second year from the bud. We planted a year old vine that bore the next season, and last season, which was the third year in our possession, it bore seventy-five bunches weighing from a half to a pound each, the berries only a little smaller than a majority of Black Hamburgs. Now it contains at least one hundred and fifty bunches."—*Germantown Telegraph.*

"The question that has often presented itself to my mind, is this: Is it an object to enter into the cultivation of the grape for the purpose of supplying the demands of the market? Good judges estimate that an acre of Concord grape vines, set eight feet apart, or four to the square rod being 840 to the acre, will produce the fourth year after planting, 20 lbs. of fruit per vine, which would be 12,800 lbs. to the acre, worth probably 10 cents per pound, amounting to $1280 per acre."—*Boston Cultivator.*

Something New About Grinding Wheat.—It is said that in the case of dry, flinty wheat, of which the Black Sea is a sample, if a pail of water is poured on eight or ten bushels of wheat in a box, often stirred for about two days before milling, that there will be an improvement in the flour, the bran being softened (not affecting the flour), and thus cut less fine, and carried with the bran.

A New Stump Machine.—Somebody says you must bore a hole in the stump about a foot deep; put in half a pound of oil of vitriol, and cork up tight.—In a few months the stump will be eaten up, that is, rotten.

ABOUT FRUIT.

Trees may be planted deeper on dry than on wet soil. The best rule is, especially with pears, to set in the same depth as in the nursery, and then gradually to heap up, where that is desired.

The Glout Morceau is an excellent pear this winter. This fruit grows best on old, thrifty trees. On the quince stock, it deteriorates. A sandy loam seems its favorite soil.

Salt is the best of manures for asparagus. A dry soil is indispensable.

If a fruit is too sour, water the tree well if the soil is rich; if poor, use liquid manure; and your fruit will be less tart, and larger. If a fruit lacks acid and flavor, plant on dry soil. F. G.

PEACH GROWING.

Ed. Valley Farmer: I will give you my experience in peach raising. I planted five seedling trees the spring of 1850, two of which died in August from the extreme drouth; the others bore some peaches in '54; and in '55 they were very full. Two of them were clings of the Indian variety; the other was a freestone of fair size, nearly white, and rather tart. They stood twenty feet apart, the freestone in the middle.—The clings were both killed the next winter, the other was not much injured, but did not bear any fruit for two years, and never has bore a peach within eight feet of the ground but once since, and that was in '61; it now measures thirty-seven inches in circumference two feet from the ground. It and other seedlings about the house, have bore some fruit on the branches over ten feet from the ground nearly every year; they have not a live bud on them now within ten feet of the ground, while the upper branches have very few dead buds on them.

I commenced planting budded trees in '57, and planted a few each year for three years, till I have about a hundred, and I reckon they are the largest of their age in Clinton County, many of them measuring from eighteen to twenty-four inches in circumference a foot from the ground; they are headed low, none of them being more than three feet to the branches; they have not borne a blossom except in '61, and then they were nearly all killed while in bloom. I did not get more than three or four bushels of peaches off the whole orchard. I cannot now find a live bud within eight or ten feet of the ground, and not very many higher up, and on some of the early trees none at all.

I suppose I have as good a soil to grow trees in as there is in the county; it is a light loam with a yellow clay sub-soil; it was covered with hazel and red pin-oak bushes, with a few hickorys and post-oaks in places. I suppose the situation is the trouble, my farm is on the north side of an arm of prairie running down between two small creeks, that are about two miles apart, and about one mile west of the main creek. I suppose my orchard is some six or eight feet lower than the prairie, a mile or more west of me, it has woods within twenty rods on the north, forty on the east, and about three-quarters of a mile on the south, while it is open on the west for eight or ten miles.

There is an old peach tree about two miles north of me on the north side of a hill right between two points of timber in one of the coldest places in the country, that I think, has never missed bearing except in '56, since I have been in the country. C. T. S.

Trenton, Ills.

ABOUT CURRANTS.

We cultivate our grapes and strawberries carefully, and most other fruit we raise. But, the poor currant, that has to take care of itself: it is so common, and so hardy. And yet the currant would prosper exceedingly, if it was properly treated. There would be currants like cherries, and an abundance that would astonish us.

Transplant your currants;, be a little careful with them, and give them a decent soil, made rich and mellow. If it is a deep, black soil, it will look all the better. Keep the grass out, and let the currant, for once, have fair play—have the ground to itself. Cover the spaces between the bushes with saw-dust or straw to keep the ground moist and free from weeds. Do all this, and you will see how delighted your currant bushes will be. They will grow so lusty you will smile. Dark, coarse, stems, full of juices.

Set the plants four or five feet apart. But, you must attend to them. They will grow too bushy, if you don't. Cut out where they are too close, and let the sun well in. This will give you large, early, well-ripened fruit. By shading your bushes, the fruit ripens several weeks later. Our neighbor has a row of bushes on the south side of the fence. We have a row on the north side—a board fence. Our neighbor has ripe currants two weeks sooner than we. We have one advantage over him: we have later currants. The best way, is to own the currants on both sides of the fence.

It is now pretty well understood that old currant bushes are not so good as new ones. Cut down every three or four years, or, if you are pretty lazy, five years. You must, of course, encourage an equal number of shoots to grow the year before, so as to take the place of the old ones. In this way you can keep your currant bushes going for many years. But don't let the soil run down. Give it manure once in awhile.

Currants are an ornament to any garden. And how many uses do we put them to! Give them a chance.

PERSIMMONS—ROBIN, &C.

Ed. Valley Farmer: I wish through your valuable columns to ascertain the time and mode of grubbing and destroying the persimmon root, as I have never been accustomed to them until since in Kansas. I have dug them at leisure, which has generally been in the spring and fall, and the more they are dug the more they spread. Can any one give information on the subject?

I noticed an article on the robin destroying curculio. Sir, I wish to say that the robin is rather partial to us here. He comes here in the fall sometime in October and remains during the winter months until from the 10th to the 20th of March, when he suddenly disappears and is no more seen until fall. So you see we are not blessed by his summer warble when he is most needed. Can any one give information whether they breed in the Southern States or not, or why it is that they do not remain and breed here, as there are as many insects here as in any place that ever I have lived.

The best substitute that we have here for the robin is the crow, and he is not a welcome visitor in time of green corn; but we let him peck rather than dispense with him. J. G. S.

Le Roy, Kan.

RAISING ONIONS.

The onion is one of those crops which will give large profits on little land. It comes under the head of garden vegetables. Hence, to an individual who has only little land—say, an acre or two, or even less—the onion is just the thing to realize large profits; and it is often employed. Thousands of people with but a small spot of ground, have supported a family, and many have laid up money besides. In New England the thing is extensively done; in the West less, and that for an apparently good reason—the market—and then grain can be abundantly raised. Hence, only what is wanted for use is raised in the West. And, yet, the onion crop can be made profitable even here; for some are raised for market, and it is always an advantage to grow as much as possible of anything we raise on the ground occupied.

The requirements are, a rich soil. That sums it up. It wants a dry soil. A sandy soil is good. Soil where corn was raised the year before, has proved to be an excellent soil. Apply manure, almost any kind, in the fall, and plow in about four inches. In the spring, cultivate and harrow. Cultivate several times during the summer, keeping grass and weeds out, and the ground mellow. If the drouth is not too great, there will be a good crop, unless (and here is the great point) the worm destroys it, which is but too generally done. All who have raised onions, must have seen now and then an onion stalk turn yellow and die. Sometimes whole fields are destroyed in this way. The season has probably considerable to do with this. There has no cure been found as yet, we believe. Still, the worm is apt to destroy only a part of the crop; seldom the whole crop; so that the work will not be lost.

A rich, dry, sandy soil, then, is the soil for onions; and if the weeds and grass are kept out, and the ground well stirred during the fore and greater part of the season, the chances are decidedly in favor of a remunerative crop. All things favorable, from 800 to 1000 bushels may be raised from an acre.

Loss of Fruit Trees in N. W. Missouri.

Ed. Valley Farmer: I was surprised to see nothing in the February and March numbers of the *Valley Farmer* on the effects of the freeze last October on the young orchards of the country. I would like to know what extent of country the disaster is confined to. Is it possible that it is confined to North-West Missouri? Some of the old settlers here lay it in part to the locusts, they were very plentiful here last June, and stung all the fruit trees that were near the brush badly. The reason they give for thinking so, is, that the last locust year, 1845, there came a severe freeze in December which injured the young orchards, but not near so bad as this winter has. I don't see what the locusts have to do with it, unless it was an effort of nature to heal over the stung places, thereby causing a late growth. Several gentlemen having young orchards on the prairie at a distance from the timber, have told me that their trees were not injured, but they may be mistaken. I have not examined any so situated.

Some of the peach trees, and all of the sweet cherries, are killed, while the pear trees, so far as I know, are not injured.

I wrote you in December that I could see no difference in reputed hardy and tender varieties, but a closer examination has shown that the Rambo, Summer Queen, Fulton, Ortley, Early Harvest, Maiden's Blush, and Fall Queen have suffered the most in about the order named. All of my Rambos over four years old are killed including some bearing trees that were top grafted.

It is a severe loss to those that were raising orchards to have their trees killed just as they were beginning to bear, and after they have had all the trouble and no profit; and those that have taken the best care and have the thriftiest orchards, are the greatest losers.

The peach buds were all killed the first of last month; the mercury at 10° below zero followed by a bright sunshiny morning. So we will have no peaches in this section this year.

Jno. P. McCartney.

Near Cameron, Mo., Mar. 10, 1863.

[Written for the Valley Farmer.]

CITY AND SUBURBAN GARDENS.

One would naturally suppose that the residents of cities and towns, and their suburbs, would, for various reasons be only too glad and desirous to make the very most of their small lots of ground, whether a mere front and back-yard, the more pretentious lot, or the blank and bare walls of their dwellings and outbuildings, all of which might be turned to handsome account, either for profit or pleasure, at the will of the owners. Yet such is very seldom the case with the great majority, although in every city is to be found examples of what can be done even in the smallest space; but it does not appear to be very contagious, and thousands of city dwellers live on unmindful of the enjoyments within their reach.

The Merchant, Clerk, or Mechanic, who toils and pores all day over his goods, tools, or books, one would think would be refreshed and invigorated if he could, or would, spend a half hour in the evening trimming and training his grape vines, tying up his roses and other choice flowers, or weeding out his small carrot and onion beds. Many a mess of tender succulent vegetables and salads, might be grown on the smallest space, if judiciously selected and managed with regard to kinds which should occupy certain situations, the getting several crops off the same ground, &c.

As fertilizing material can be obtained in abundance, over-cropping need not be feared, and be only limited by the length of the season; and although, in growing vegetables for your own table, much might not be saved pecuniarily, it would yet be a little, besides having them perfectly fresh and sweet instead of the often stale stuff bought at market.

Where space is very limited, however, we would advise to grow only the very choicest products the place is capable of, even if it does cost more; and if you prefer to go to market for your esculents, grow fruits, or fill your little place with flowers, of course selecting such kinds as are adapted to certain situations as a North or South border, an open or a shady situation, a hot or a cool breezy place. It is to the general lack of knowledge, as to what kinds are best adapted to certain places, that we think the failure of city gardens is mainly due, and to which we propose to direct attention in a few short articles.

"While some affect the sun, and some the shade,
Some flee the city, some the hermitage."

As with men, so with flowers, for while the greater part of both prefer to bask in the smiles of sunshine, there are those which delight only in retiracy and shade, and though they may be few, they should be selected for their appropriate locations; and for every spot, no matter how sunny or otherwise, suitable plants may be found.

At present we would call attention to the numberless bare, blank walls, ends of houses, sides of stables, or some other such space. How many tons of the most delicious grapes might be grown on all of them. There is scarcely an aspect where grapes would not ripen against a wall, in our latitude, and how much better would it be to see such walls covered with a rich drapery of green leaves and purple clusters, to say nothing of the profit and pleasure of a few hundred lbs. of choice grapes or a keg of the purest wine—than to see the red brick walls glaring and shimmering in the mid-day sun.

The grape vine may easily be trained around and among doors and windows in any direction, and with little trouble. Though the light is tempered and subdued by stealing in through the light green foilage; though the delicate tendrils do occasionally clasp the window curtain's cord—the light and air of heaven will be all the purer for that.

The soil for such grapes may or may not be made very rich, for as the vine gets old and covers a large space, the soil may be enriched and the plant fed to correspond. The grape does not require an over-rich soil, but large plants require room to correspond with their roots; but one thing should always be well attended to, and that is, to see that they are well drained. If it can't be done otherwise, elevate the entire bed in which they grow above the surrounding level.

There should always be affixed to a wall, against which grapes are grown, a frame of trellis or lattice work, which may be made plain and cheap, or artistic and neat, and placed about six inches from the wall; it is much more convenient and economical to train and tie the vine to; it is better for the vine, and saves the wall.

We can conceive of no better variety of grape for this purpose than the "Herbemont," which though a "leetle" tender in this latitude, would in the city be, without doubt, quite hardy, or might easily be protected the first few years, after which it would be safe. It is of the most vigorous and redundant growth, capable of covering a great extent of wall, there is no more productive variety, the clusters hanging in masses or ropes along the branches; and for quality, in our judgment, no native variety yet equals it.—"Bags of Wine," Downing describes it. It also makes an excellent wine. Bunches large and very handsome, though the berries are small—it is our first favorite.

The Concord for many of the above reasons, would be an excellent variety for this purpose, would cover a large space, and produce enormously under unfavorable circumstances, while for all rather confined and limited spaces, the Delaware should by all means be chosen for its many proved excellencies, and the Catawba need not be rejected.

If there are any who do not want to grow the grape, there are hosts of ornamental plants well adapted to covering walls, arbors, &c.—but enough for the present. C. S.

St. Louis, March 8th, 1863.

Grafting the Grape.—The *American Agriculturist* says:—The grape is so readily propagated from cuttings and layers, that grafting is seldom practiced. The scions should be cut before vegetation starts. The grafting is done when the vine is in leaf, and danger of bleeding is passed. The earth is removed from around the vine, which is cut three or four inches below the surface. The stock is split and the scions inserted in the usual way of cleft graft-

ing. No wax or other composition is applied, but the earth is merely replaced. Another mode has been recommended, which is to split a large vine at intervals of one or two feet, and insert the ends of the scions, which are cut to a wedge, in slits. The vine is then buried horizontally so as to leave one or two buds of the scions above the surface. The vine so layered throws out roots during the season, and in the fall or following spring may be cut up so as to leave a share of roots to each graft.

[Reported for the Valley Farmer.]

Meramec Horticultural Society.

ALLENTON, March 5th, 1863.

The fifty-first monthly meeting was held in the school house. Vice-President Seymour in the chair.

The minutes of the former meeting were read and adopted.

Motion to amend the Constitution laid over till next meeting.

The Executive Committee reported as the subject of discussion for next meeting, "The Planting and Management of Small Fruits." Adopted.

REPORT OF FRUIT COMMITTEE.

The Fruit Committee finds on the table but few samples of fruit. The Newtown Pippin very fine and in good eating order. Jeneton in good condition, and the Priestly one of the most miserable varieties upon the table for a long time. J. S. SEYMOUR, Ch.

It was, on motion, RESOLVED, That the Secretary be requested to prepare an Essay on "The Barometer: Its Utility to the Agriculturist," to be read at the June meeting.

Considerable discussion was had upon the merits of the several varieties of apples as market fruits, and their adaption to the soil and climate of this township as shown by actual and continued experiment, when the Newtown Pippin, Pryor's Red and Jeneton, were adopted as the "three best apples to plant for market."

The Newtown Pipin had almost the entire vote, the others were adopted after several ballots.

Vice-President Harris being called to the chair, J. S. Seymour was requested to give his mode of planting. He plowed the ground well first, then dug a hole the same depth that was plowed, and wide enough to hold the root easily: he found this much better than digging the holes deeply in the stiff clay. Shortened in the tops and trimmed the bruised roots well back so as to cause a good growth of fibrous roots. In spring, prefer planting as the buds begin to push, but think fall planting best, because the ground can be got in a better condition than in spring, and there is more time. Prefer three-year old trees to any other; have planted five-year olds that have been transplanted at three years, and they did well and made good trees.

Mr. Vaughn: Stated a case in which two orchards were planted out, the one by shallow planting and cutting back the heads, and the other by digging deep holes in the clay and leaving the whole head on. The first did not lose one-half per cent., and the second lost a large proportion.

A conversation took place upon the mode of cutting back the heads, by cutting indiscriminately all clear off to the height required, as compared with the mode of thinning out the shoots of three-year old trees, but permitting a proper number of terminal or well developed buds to remain on to lead off in the circulation of the sap. By some attention to this the extremes of cutting too much and too little would alike be avoided, as also the common blundering mode that originates in the idea that if you cut, it makes no difference how.

The Chairman announced that the next meeting will be held at Eureka school house, on the first Thursday of April, at 10 A. M. On motion the meeting adjourned. WM. MUIR, Sec.

FRUIT CULTURE IN EGYPT.

It is with regret that I see one of the best fruit growing countries in the Western States, so neglected in the cultivation of good fruit. I will, for the benefit of those engaged in fruit culture, or those who may engage in it, give the names and quality of a few varieties that I have tested in our climate. I will commence with early apples: Princess' Early Harvest, ripens during the last days of June. This apple is one of the best of its season, a fine large yellow apple, will keep a month after being ripe, has the highest perfume of any other early apple, and cooks well. Those who wish a splendid early fruit can do no better than to set this variety. You may set your trees close, say twenty feet apart, as they never grow large like many other varieties.—Next in rotation is the "Red Astrachan." For beauty, this apple excels all of its season; in fact there is no more beautiful apple of any season. First, it will bear if cultivated right, in two years, that is four years from graft. The apple is a light crimson red, covered with a beautiful white bloom, measuring three inches in diameter.—The tree forms a fine head growth rapidly, the apple rather acid. I advise all to set a few trees of this kind, as the fruit will sell well, ripens two weeks after the Early Harvest, keeps as long and cooks well. The "Sweet Bough" is a fine dessert apple, is ripe in first of August, and will do fine in this climate. The apple measures four inches in diameter. This is a fine bearer, growth thrifty, will not bear under five years from graft, forms a beautiful head, will keep to the 15th of September.

I will now give a few hints on cultivation and pruning. By all means use lime; don't be afraid of it killing trees. Put a half bushel to the tree, the next fall after setting your trees.—Put your lime in a circle around your trees, say six inches from the trunk. Let it lie all winter; in the spring take a fork, not a spade, and turn your lime under, always keeping your face toward the tree. You will seldom injure roots if this plan is observed. Try it. You can produce one inch of solid wood per year by this plan. I have tried it, and a little more. Use soap on your trees; don't be alarmed if you touch a leaf and it turns red, it will not hurt apple-tree bark. Take an old sock-foot, and a quart of soap, rub your trees from the limbs to the ground—rub hard. Soap will destroy the borers. You can't find three trees in my orchard that are troubled with them. Never neglect soaping your trees twice a year, in March or April, and September. The borer lays its eggs in September, on the

bark, where they remain all winter. In May they hatch and work their way into the bark, and burrow between the bark and wood the first winter. The second summer they work their way through the heart, and your tree is gone. Soap, in March, cooks these eggs so that they don't hatch. Nine-tenths of the trees that die are destroyed by the borer.

Now about pruning. Many think they must have their trees trimmed six or seven feet high, before a head is formed. This is a bad plan.—Your trees have a hot time getting sap up this long trunk, in July and August. I think your trees are parched to death on the south-west side. Three and four o'clock sun is the time sap is cooked in this climate. Head your trees down to three and not over four feet from the ground. Cut back your top one half its growth the first year. This will form a low, well-spread head, cut out all branches that point in. This will let the light and air through your trees—You cannot have good fruit with a mat of limbs in the centre of your trees. Level the top limbs of your trees the second year, always cutting to and outside the bud; this throws your top out. If these rules are observed, you can have your trees all alike. W. M. JEFFREY. —[*Ex.*

Facts About Apple Trees.

The most important of all fruits which can be produced in temperate climates, if not the most important fruit which the Creator has bestowed upon man, is the apple. Were people generally in possession of information which would enable them to form conclusions in relation to the value of a single apple tree, no one who has a spot of terra firma large enough for a house lot, would neglect to plant one.

Hayward speaks of an apple tree in Duxbury, Mass., which was upwards of 100 years old, was 16 feet in circumference eight inches above the ground, and which produced in one year fruit from which 10 barrels of cider were made, besides 30 bushels of apples for the cellar.

An apple tree in Natick, Mass., was grafted to the Porter apple when 75 years old, and the seventh year from grafting produced 15 barrels, which sold for $30.

The original Hurlbut apple tree produced 40 bushels in one year, and 20 the next.

The original Bars apple tree produced 60 bushels in one year.

In Orange, N.J., a Harrison apple tree produced 100 bushels in one year.

An apple tree in Farmington, Me., produced 16 bushels the 16th year from the planting of the seed.

Cole says he has had fruit from an apple tree in Plymouth, Mass., when the tree was 200 years old.

We have seen an apple tree on the farm of Mr. Calvin Pease, of Wilton, Me., from which a crop of 24 bushels of Baldwins were gathered in one year.

An apple tree brought from England and planted near Hartford, Conn., produced fruit when 209 years old.

Several apple trees in the United States are 12 feet in circumference each.

Apple trees are found to flourish best on undulating lands or hills. In low and sheltered situations there is more exposure to extremes of heat and cold.

Apple trees are more sure in their products in northern, north-western, or western exposures than in southern or eastern ones.

Apple trees are more exposed to winter-killing in situations where frosts kill vegetation earliest in the fall.

The Baldwin tree is nearly certain to winterkill where the thermometer sinks to 38 degrees below zero.

The summers are too long at the South to produce winter apples, as they over-ripen, and the Baldwin apple becomes a summer or fall apple when cultivated in the South.

Trees grafted near the ground are much more liable to winterkill than those which are grafted on the tops.

Branches of trees which grow in a horizontal position come into bearing sooner than those which grow more nearly in a perpendicular position.

Crooked trees, and leaning trees are the best bearers.

English orchardists, in order to hurry certain trees into bearing, bend and tie down the branches.—[*Ex.*

OATS CHANGING INTO RYE, BARLEY, &C.—The savans have a new hobby. The "Mark Lane Express" takes ground, and quotes from a writer (Gerard) of the 17th century, that oats may be transmuted into other grain. The thing has also been experimented on recently, says the "Express." A man planted oats in his garden; cut it after it rose to some extent; repeated the operation twice more, each time the grain putting out new tillers. By protecting the plants during the winter, they grew the following spring, which in itself would almost seem to be a miracle, as the oat is an annual. But it grew and produced barley. The berry was thin, but it was barley, and the malsters highly approved it.

HOW TO LEARN TO EAT LESS.

In an article in the February number under the caption of "less food," the writer says, "If people could only learn to eat less, there would be, not only less waste, and more health and usefulness, but more happiness and cheerfulness of spirit—and there never would be dyspepsia." This and nearly the whole article is mainly very true, and if true, very important; but the root of the evil, in my estimation, is not touched at all. When doctors are to prescribe for diseased conditions, the first thing of importance is to "find out what the matter is," ascertain the cause and remove it if possible. With only the light of the article referred to, it will be difficult to convince people that they really do eat too much. They say they eat no more than appetite demands, and that nature does not make a demand for more than she needs. This I think is sound doctrine, and yet I believe that most people do eat too much. The error is begun by eating too fast. Americans are a fast people. They like to travel fast, get rich fast, work fast, eat fast, drink fast, and take the chances of going to destruction fast. The haste with which a dinner is swallowed for instance, on board our Mississippi steamers, is quite astonishing to one who has not been accustomed to such fast ways.

The consequences of eating too fast, are, first: The food is not well masticated—is not reduced to such a comminuted, pulpy mass as to fit it for being readily acted upon by the gastric juice in the stomach.

2nd. The sufficient secretion and admixture of saliva, which is essential to good digestion, is not promoted.

3d. In order to facilitate the rapid swallowing of half masticated food, unmoistened by saliva, an undue proportion of liquids is required; hence, we drink too much as well as eat too much.

4th. The sense of taste—the enjoyment of eating—is gratified only in a limited degree, hence one reason that it requires more food to satisfy the appetite.

5th. The most important consequence is that for the reasons already given, the food we take is less perfectly digested, the waste of the system is unduly promoted by the too free use of liquids, and hence an appetite is created for larger quantities of food to supply the demands of the system.

In this view of the case it is easy to understand how we may eat too much and still imperfectly supply the demands of nature for the wants of the system, and how an appetite is created for more food than would otherwise be required.

Therefore, if we would learn to eat less, we should first learn to eat slowly. We would then enjoy our meals better, the appetite would be satisfied with less food, and what we take would be better and more easily digested. The demands of nature would be better supplied, and there would be less temptation to excess in drinking either water or more potent liquids. We would be healthier and happier, wiser and better, stronger and richer. Imperfect nutrition creates a feeling of want, which the unhappy sufferer too often seeks to relieve by the use of fiery beverages. Eating fast and drinking too much water has often much to do with the intemperate use of alcohol. L. D. M.

BRYANT AS A POET.

William C. Bryant is considered America's best poet. He has long been considered so—say forty or fifty years. This looks somewhat like fame. Mr. Bryant is in his seventieth year—and yet his poetry is as fresh as ever, and in the same peculiar vein.

The distinguishing characteristic of Mr. B. as a poet, is eloquence. It may be said of Milton's blank-verse that in it he sings. This is eminently so with the first several books of "Paradise Lost." The same can hardly be said of any other poet. Thomson has vigor and sentiment; but he is not a singer; nor is Mr. Bryant.—"Thanatopsis" is the most eloquent dissertation we have ever seen on the subject. There is nothing new; nothing striking. There is, however, a good selection, showing at least the cultivated amateur, if not the artist.

But Mr. Bryant is *not* an artist, in the truest sense of that term—in the sense in which Shakespeare is an artist, where art hides art, showing only its effect.

Mr. Bryant's poetry has one fault: It is conceived and brought forth with labor. It has earnestness to recommend it; but this very earnestness betrays effort. Mr. B. owns to the difficulty of writing verses; and says few people

know how much he rejects. But the true poetic feeling is there, if it is conceived in pain. He always takes the poetic view of a subject, the best of common objects, so that any one at all cultivated, can understand him. He exhibits less learning than enthusiasm, and makes nature his common field of thought. He is the disciple of Wordsworth, and his most creditable follower. He lacks Wordsworth's simplicity, but has more earnestness. As nature in England finds her best interpreter in Wordsworth, so Bryant is her best exponent here. He is to American literature what Chaucer is to English—the lark that sings at dawn; and he will never be forgotten, though he may be eclipsed.

To quote from Bryant, is to quote household words. Here is a small translation from the Spanish less known:

SONG.

Alexis calls me cruel;
The rifted crags that hold
The gathered ice of winter,
He says, are not more cold.

When even the very blossoms
Around the fountain's brim,
And forest walks, can witness
The love I bear to him.

I would that I could utter
My feelings without shame;
And tell him how I love him,
Nor wrong my virgin fame.

Alas! to seize the moment
When heart inclines to heart,
And press a suit with passion,
Is not a woman's part.

If man comes not to gather
The roses where they stand,
They fade among their foliage;
They cannot seek his hand

Here is his sonnet to

WILLIAM TELL.

Chains may subdue the feeble spirit, but thee,
Tell, of the iron heart! they could not tame!
For thou wert of the mountains: they proclaim
The everlasting creed of liberty.
That creed is written on the untrampled snow,
Thundered by torrents which no power can hold,
Save that of God, when he sends forth his cold,
And breathed by winds that through the free heavens blow.
Thou, while the prison walls were dark around,
Did'st meditate the lesson nature taught,
And to thy brief captivity was brought
A vision of thy Switzerland unbound.
The bitter cup they mingled, strengthened thee
For the great work to set thy country free.

The "White-Footed Deer" is an exquisite Indian tradition. For a stately march of verse, take his opening stanza to the North Star:

The sad and solemn night
Hath yet her multitude of cheerful fires;
The glorious host of light
Walk the dark hemisphere till she retires;
All through her silent watches, gliding slow,
Her constellations come, and climb the heavens, and go.

His "Evening Wind" has never been surpassed, nor his "Waterfowl," each of its kind. The "Forest Hymn" is an instance of his happiest effort in blank verse.

[Written for the Valley Farmer.]

WHAT IS LIFE?

The combinations of the elements of carbon, oxygen, hydrogen, nitrogen, the salts and metals, are not sufficient to explain the life of the organic creation. But as there is no power without matter, we come to the absolute conclusion, that there exists in nature an organic matter, which is the active, self-forming, individualizing principle. That we do not know this organic matter, that our senses lack the capacity to discover or conceive it, furnishes no proof that the first cause of life only exists in the combinations of the to us known elements.

The organisms rule the elements, attract them, repel them according to their wants, feed and strengthen on them until their cycle is completed, whence those elements dissolve into their original parts, while the organic matter may enter into other combinations unknown to us, for the reason that our capacity for such conception is wanting, although the same to us known elements composing the bodies of animals and plants in kind, property and proportion: still every individual is another, is self-existing, self-forming, self-creating. Every human being is possessed of different power and capacity, because he is an individualized organism. And yet we do not know the first, the most simple organic law; notwithstanding this, there are many men of known abilities in natural science who attempt to prove, that all organisms were only the consequence of the combinations of the to us known elements; as though nothing existed in nature which we did not discover through our senses and comprehend through our faculties.

We only know the chemical properties and affinities of certain elements which enter into organic life; we know certain physical and mechanical laws by observation. Light, warmth, electricity we know by their appearances; the being of them we know not. The first cause of life lays without our senses and comprehension, and will therefore forever remain unexplained.

EMIL MALINCKRODT.

THE VALLEY FARMER.

BY MISS SARAH A. SPURGIN.

Of all the papers in the West,
We like the VALLEY FARMER best;
We hope the Editor is true,
In all the ways which he pursues,
And valuable matter gives
That teaches us the way to live.

It tells us how to tend the field,
And how to make the produce yield;
And when, and how, to sow the grain,
To profit by it, and get gain;
And how to plant and grow our trees—
And almost anything you please.

For garden-tending—all is there—
Put in its place with decent care.
The poultry yard is in the row;
By its advice we too can know
That they are just as easy raised
With little work, if rightly grazed.

Dairy directions there we see,
Which to us will quite useful be;
To make the butter and the cheese,
It all is done with pleasant ease.
If we would follow its advice,
I'm sure 'twould pay us more than twice.

The cooking room we there can find,
And good advice of every kind.
No matter what we wish to know,
To the VALLEY FARMER we can go;
And there we'll find a full receipt
Of everything—it's all complete.

Of sickness too we there can see,
Of what the remedy may be.
It gives advice for cough or cold—
The worth of it could not be told.
And every farmer it would pay
To take this paper right away.

And last of all, on cane it treats,
Of how to work in all its sweets,
Of how to grow it, the right soil,
And to proceed with it to boil.
Who would not think this paper best
Of any published in the West?

FEATURES OF THE FEET.—The French foot is meager, narrow and bony. The Spanish foot is small and elegantly curved, thanks to its Moorish blood, corresponding with the Castilian pride—"high in the instep." The Arab foot is proverbial for its high arch; "a stream can run under the hollow of his foot," is a description of its form. The foot of the Irish is flat and square.—The English foot is short and fleshy. The American foot is apt to be disproportionately small.

THE GRAPE AS A MEDICINE.

We need not tell our readers that the grape is healthy. In Germany it is used as a medicine—regularly, as water is used in the water-cure. This is probably carrying the thing too far. That the grape, however, when largely used, has an effect, seems reasonable, though little or nothing is demonstrated. We know the grape is grateful to the palate. It is said to have an effect upon the mucous membrane of the respiratory organs, consequently efficacious in pulmonary complaints. This will do for a clique to advocate. Long experience has demonstrated that the grape may be used with impunity, unless in very delicate organizations, in which case, a moderate use is on a par with the use of any healthful vegetable. With the dyspeptic little or nothing will agree at times. Moderation is always a safe rule in diet; and when followed in the case of grapes, will be beneficial rather than hurtful. Use the grapes then—as an edible.

GOD SPEED THE PLOW.

God speed the plowshare! tell me not
Disgrace attends the toil
Of those who plow the dark green sod,
Or till the fruitful soil.
Why should the honest plowman shrink
From mingling in the van
Of learning and of wisdom, since
'Tis mind that makes the man?

God speed the plowshare, and the hands
That till the fruitful earth,
For there is in this world so wide
No gem like honest worth,
And though the hands are dark with toil,
And flushed the manly brow,
It matters not, for God will bless
The labors of the plow.

ENGLISH GIRLS.—The English girl spends more than half her waking hours in physical amusements, which tend to develop and invigorate and ripen the bodily powers. She rides, walks, drives, and rows upon the water, runs, dances, plays, sings, jumps the rope, throws the ball, hurls the quoit, draws the bow, keeps up the shuttle-cock, and all this without having it pressed forever upon her mind that she is thereby wasting her time. She does this every day, until it becomes a habit which she will follow up through life. Her frame, as a natural consequence, is large, her muscular system in better subordination, her strength more enduring and the whole tone of her voice healthier.

Girls think of this.

Editor's Table.

Proceedings of the State Horticultural Society.

The Proceedings of this Society are published in pamphlet form, and are ready for distribution among the members, the number of copies for each to be in proportion to the amount subscribed. They are printed in good style and make a very valuable work of 60 pages. We had a number of distinguished horticulturists from a distance, whose remarks and essays add great value to the discussions. Not having space to publish these proceedings in the "Valley Farmer," without crowding upon our other departments, we have issued a few hundred extra copies at our own expense, and will furnish them to our readers at cost price, 25 cents. Some of the essays alone are worth this sum. To every fruit grower the pamphlet is worth several dollars. All the fruits are taken up and discussed, and lists adopted of the best varieties. The best modes of culture are pointed out, and a vast amount of valuable pomological information given. By enclosing 25 cents in a letter to the Editor or Publisher of this journal, the pamphlet will be sent postage paid.

PEORIA PLOWS.—We take pleasure in referring our readers to the advertisement of Messrs. Pratt & Fox, of this city, who have the above Premium Steel Plows of every kind in store and for sale at the lowest market rates. Also Patent Wire Fencing, which makes a durable fence for a variety of purposes. Call and see them at 139 and 141 Main St.

FRUIT FARM WANTED.—A gentleman wishes to purchase a fruit farm either on the Ills. Central R. R., the lower Mississippi river, or the Iron Mountain R.R.

He wants elevated land suitable for orchards and vineyards. Would like a farm of 80 or 100 acres, with from 20 to 40 acres cleared and fenced, and a comfortable house upon it. Any person having such a farm, or knowing of such one, will please address the editor of this journal.

NEW VETERINARY WORK.—Our readers will be glad to learn that Dr. G. H. Dadd, Veterinary Surgeon, now residing in Chicago, Ill., has a work in the press, which is calculated to be of great value to stock raisers, it is entitled—"A Practical Treatise on the Most Obvious Diseases Incidental to Horses; Together with Directions for the Most Rational Treatment of the Same; accompanied by a Valuable Essay on the Art of Shoeing Horses." Published by Lord & Smith, Chicago, Illinois.

We infer, from the well-known reputation of Dr. Dadd, that this work will command a large sale. Any of our subscribers desiring this work, are requested to forward their orders to this office, No. 97 Chesnut Street, St. Louis, Mo.

The Publishers of the above work also announce, that they have prepared some very excellent medicines for the treatment of some of the most obvious diseases incidental to horses. These medicines will probably command a large sale.

WHAT UTAH IS DOING.—The Saints are a most industrious people: they are also skilful. They have raised the past year, cotton to a considerable extent.—This is not to be exported, but worked into cloth, the machinery for which they are now preparing. Thus cotton fabrics will soon be an important branch of trade with the Saints. Of fruits, the Mormons have had a large and excellent exhibition at their fair the past season. The grains, also, have been favorably represented. Aside from its religion, Utah would be a desirable place to emigrate to, especially since the prospect of the Pacific Railroad. This is the making of the Mormon settlement, and will form a neighborhood with California and the Mississippi Valley.

WILKES' SPIRIT OF THE TIMES.

The American Gentleman's Newspaper. A Chronicle of the Turf, Field Sports, Literature and the Stage.

We find upon our exchange table the above named Journal. It is edited and published by Geo. Wilkes, at 201 Williams Street, New York. Terms, $4 per annum. It is issued weekly, and is the largest weekly published in the United States. All interested in Field Sports, the Turf, Stage, &c. &c., will find this one of the most interesting and wide-awake journals published. It is the only Journal of its class in the United States. Breeders and trainers of fine horses will find it invaluable.

HEMP INQUIRIES—Ed. Valley Farmer: I wish some information about the culture of Hemp. What kind of soil is best adapted? How much seed per acre? Where can seed be purchased, and at what cost? What is average crop per acre in Mo. or Minnesota? How is it cured and prepared for market? What is its average worth in St. Louis per ton? What time in the year to plant or sow; also, how should the soil be prepared, &c.? W. W. CLARK.

Bay, Mo., March 10th, 1863.

[Will some of our Hemp growers answer the above queries.—Ed.]

TAR MAKING—AN INQUIRY.—Ed. Valley Farmer: The present high prices of tar and turpentine, has induced me to think that it might be manufactured with profit. I wish to inquire of you if there is any process or furnaces used for extracting the tar, which is an improvement on the old method. Are you acquainted with the process of manufacturing tar. Any information you can give me will be thankfully received. ORVILLE WILCOX.

Cuba, Mo. March 6th, 1863.

[Can any of our subscribers give Mr. Wilcox any information.—Ed.]

EVERGREENS.

A splendid stock of Evergreens for sale, grown here, with masses of fibrous roots and sure to live when transplanted, consisting of:

NORWAY SPRUCE.	AUSTRIAN PINE.
SCOTCH PINE.	HEMLOCK SPRUCE.
BALSAM FIR.	WHITE SPRUCE.
ARBOR VITÆ.	WHITE PINE.

Price from fifty cents to one dollar and fifty cents each, as parties may order. NORMAN J. COLMAN.

A NEW COAL OIL LANTERN.—Our friend Curtiss has placed us under obligations for a new Coal Oil Lantern, useful for stable, cellar, or out-door use, and which we cheerfully commend to those wanting such an article. It gives good satisfaction, dispensing with the chimney. His No-Chimney, Wind-Proof Coal Oil Lamp, meets with rapid sale—and, in fact, if anything new or valuable pertaining to the use of coal oil comes out, he is the first in the market. We have used his brand of coal oil in our family for years to our entire satisfaction as to safety and economy.

When you visit the city, don't fail to drop in at Curtiss' Oil and Lamp Store, No. 7 South Fifth St.

FRANK BLAIR, JR.—The lovers of the St. Lawrence strain of horses will be pleased to learn that this fast trotting stallion will be at the stables of the Mound City race track four miles west of St. Louis the ensuing season. He was sired by the celebrated trotting stallion St. Lawrence. His dam was a thorough-bred mare, raised by Mr. Payne of St. Louis Co., and owned by the late Jno. Chambers. When four years old, with but little training, he trotted in 2.48, and can trot at almost any time on the Mound City Track his mile in 2.40.

He needs no particular recommendation from us.—His speed can be witnessed on the track, which is better than pen and ink recommendations. He is seven years old and sixteen hands high; color, dark brown.

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CHESTER WHITE PIGS.

We have a few pair of pure-bred Chester White Pigs now ready to be shipped. Those wanting them will address us immediately. NORMAN J. COLMAN.

ST. LOUIS NURSERY DEPOT.

THIRD STREET, OPPOSITE THE POST OFFICE.

Having leased a commodious store room on Third street, opposite the Post Office, for the sale of my FRUIT TREES, GRAPE VINES, EVERGREENS, &c., I shall be pleased to see my old customers, and as many new ones as may call.

I shall keep on hand at my Depot a complete assortment of my Nursery Stock, from which orders can be filled immediately.

I invite those wishing to purchase to call and examine the quality of the trees and plants I have for sale. NORMAN J. COLMAN.

CHESTER WHITE PIGS.

The subscriber, having procured breeding stock from one of the best Chester Co. Pa. breeders, will be prepared, after the first of May, to furnish pigs of this superior breed, in pairs from different families. They will be properly boxed with food for the journey, and delivered at express office or boat in Alton. Price $10 each. Address F. CURTIS, Alton, Ill. Residence, Fruitland Farm, Grafton road, 5 miles from Alton.

[ap3t]

TO GRAPE PLANTERS.

We have a fine stock of the following approved varieties of grapes for sale, viz:

HARTFORD PROLIFIC.	GARRIGUES.
CONCORD.	DIANA.
DELAWARE.	NORTON'S VIRGINIA.
REBECCA.	MARION PORT.
TAYLOR OR BULLIT.	CATAWBA.
HERBEMONT.	ISABELLA.
UNION VILLAGE.	

And many other kinds. NORMAN J. COLMAN.

TENBROOK'S IMPROVED NANSEMOND SWEET POTATO—Improved by selecting the large, well matured tubers for seed, from which our stock is propagated. Responsible agents wanted to sprout our potatoes on halves, at points not yet supplied. The scarcity of seed and abundance of change, promise fair returns this season. The Sweet Potato Culturist furnished to our patrons free, and to others by mail at ten cents per copy.

Price of Seed Potatoes, $3.50 per bushel; $10 per barrel (3 bushels); U.S. Currency; delivered at railroad or express.

Plants in season: 300, $1; 500, $1.50; 1000, $2.50; 10,000, $20. Packed to go safely by express.

J. W. TENBROOK, Rockville, Parke Co. Ind.

OTAHEITAN IMPHEE.

The above Sugar Cane is a variety of the Imphee propagated by Mr. Sam'l Hooker of Illinois. It grows somewhat taller and thicker than the common Cane, yields more juice, and a larger per centage of saccharine matter, does not sucker like the other, and makes a superior quality of molasses, which readily granulates. Price $1 per quart.

PLANT & BRO., 25 N. Main St., St. Louis.

Cotton Seed & Gins.

SELECTED UPLAND COTTON SEED. For sale in any quantity.

HAND COTTON GINS. From seven to twenty saws. Furnished to order.

POWER COTTON GINS. From twenty to one hundred saws. Furnished to order.

LEVER AND R. R. HORSE POWERS. Suitable for running above.

For sale by **PLANT & BRO**

April, 1863. St. Louis, Mo.

BALL'S OHIO MOWER.

The Ohio Mower has two driving wheels, thirty-six inches high, side by side like a cart, which bear all the weight of the Machine. They communicate motion to the gearing by cogs, on a concave surface, matching into ratcheted pinions on each end of a horizontal shaft. These points distinguish this from all other Machines.

These wheels act independently of each other or in conjunction, according to direction, whether on a curve or a straight line—each being competent to drive the cutter alone. They each have five inches tread, giving in all ten inches of bearing surface on the ground, for friction and adhesion, and to prevent sinking in soft ground. Their very large circumference makes them run lighter and steadier on uneven ground, than smaller ones do. As weight on the driving wheel is the source of its power, it is manifest that the more weight the more power upon the gearing. But it is still a law of nature that a great weight requires a great power to move it horizontally, or up an inclined plane, hence the lighter your machine the easier you move it; but you must have it strong enough, and that requires weight, and you must have a rapid and powerful motion of the gearing, and that requires weight; therefore it becomes important to economize for gearing power all the weight you are obliged to carry in order to obtain strength. This object is completely gained in this machine, and in no other. A machine with only one drive wheel is very far from it. Any weight resting upon the tongue or any other part than the driver, is a loss of so much power and yet must be carried along.

The Cutter-Bar and its Connections.—The cutter-bar (or finger-bar) is made of cast steel, is four feet and six inches long, and strong enough for any ordinary use or accidents. It is so attached to the frame of the machine, by hinge joints, that it is perfectly controlled by a lever in the hand of the driver, when in his seat, to raise it over stones, stumps, sticks, cut grass or other obstructions, while in motion. He can also set it by a screw to cut high or low, and can easily fold it up to pass through narrow gates or to travel upon the road. Our plan of doing this we consider much better, easier and much safer than any other yet known. The bar is hung at the hind end of the frame, back of the centre of the drive wheels about twenty-two inches. This position gives it many advantages over any other position, some of which we will briefly state:

1st. It gives the driver the fullest opportunity to see obstructions before the guards or knives strike them.

2d. It avoids the danger of a fractious or frightened horse backing his heels against the guards or knives.

3d. By reason of the lifting direction of the draft and the sled shaped bottom of the drag bar, it rises better out of dead furrows, ditches, and over ant hills and bogs.

4th. It avoids the necessity of a little truck wheel to carry it, which does not run so steady, nor get over the cut grass so well as a slide, nor turn a short corner so well.

5th. It does not draw down upon the horses' necks at all, but is carried by the drive wheels when its weight is used for power.

6th. It is the only position to make a good reaper.

The complete adaptability of this cutter-bar to any and every variation of surface, by its perpendicular motion at each end, as well as by its rolling or warbling motion, renders its performance not only perfect in quality, but easy and agreeable both to the team and gearing.

We must not pass this point without saying a few words about our guards. They are made of the best wrought iron, and at the place where the knives pass them, they are laid with cast steel, brought to an acute angle and highly tempered. No better guards have ever been made, nor do we believe as good ones have been or can be made without our machine to make them with.

The Tongue, Side-Draft and Balance.—The tongue is so attached to the frame, by a sliding bolt, as to give the operator entire control over that annoyance, so much complained of in other machines, called "side-draft," one pound of which is worse than twenty pounds of direct draft. There is positively no unavoidable side-draft either in mowing or reaping with this machine. The weight of the tongue is so exactly, balanced by the weight of the driver, gearing and position of the cutter-bar, that there is no more weight on the horse's neck than a common tongue gives.

Throwing out of gear and Backing.—The motion of the first shaft is communicated to the crank shaft by a bevel pinion and wheel, but this bevel pinion is under the control of a clutch, which is attached to a lever at the feet of the driver, who can instantly connect or disconnect the gearing, and when the cutter-bar is folded up, he can effectually block both the main wheels and bring his team to a sudden halt.

The first pinions in mash with the drive wheels, have only a ratcheted connection with the gearing—i.e. a connection in one direction, or when the machine moves forward—therefore when the machine moves backward it is naturally out of gear, and runs backward as easily as a cart.

Norman J. Colman,
AGENT,
97 Chesnut St., Saint Louis, Mo.